HBJ A Harcourt Brace Jovanovich Publication

June 1982/$2.00

WEEDS TREES & TURF

The Journal of Landscape and Golf Course Design, Construction and Care Since 1962

Deck Construction: A Potential Bright Spot

Tree Health Is Linked to Energy Reserves by Shigo

Greenbug Overwintering Proven in Ohio

TURFGRASS SEED PRODUCTION FORECAST

Without a summer application of Dursban, big problems could pop up in fall.

While most insects emerge in spring, sod webworms and other varieties don't spring into action until late summer or fall. And even DURSBAN* insecticide—which gives you the longest residual action in the business—won't protect your customers' lawns from spring to fall.

That's why it's important to apply DURSBAN twice a year—on your first round for the early risers and later in the summer to get the late bloomers.

And considering the relatively low cost of DURSBAN, a two application insecticide program makes doubly good sense. After all, DURSBAN costs as little as 35¢ per 1000 sq. ft. application. A small price to pay for protection against the immeasurable costs of call-backs and shaken customer relations.

DURSBAN gets just about every bug you'll face, too: chinch bugs, sod webworms, armyworms, cutworms, you name it.

DURSBAN. Make sure *all* insects get a shot. Available in 2E and concentrated 4E formulations. See your Dow distributor. Also ask him about our new "DURSBAN delivers the goods" incentive program. Be sure to read and follow all label directions and precautions. Agricultural Products Department, Midland, Michigan 48640.

DURSBAN

Gets the jump on late emergers.

DOW

DOW Chemical U.S.A.

*Trademark of The Dow Chemical Company.

Ad No. 1906

Circle No. 115 on Reader Inquiry Card

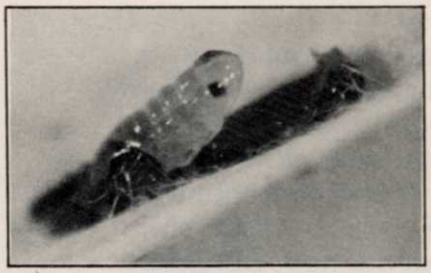
WT&T

Students compete at ALCA Student Field Day in Stillwater, OK, in March. Oklahoma State University hosted competitors from ten schools with landscape contracting programs.

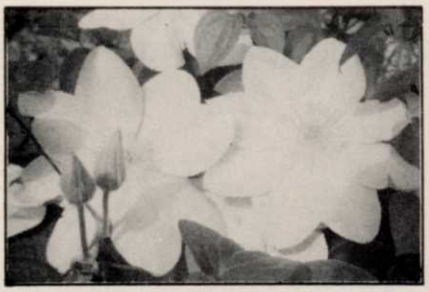
JUNE 1982/VOL. 21, NO. 6

Deck construction for extra profits . . . page 24

The forest is Alex Shigo's laboratory . . . page 28



Greenbug aphid survives Ohio winter . . . page 36



Old or new wood matters for Clematis . . . page 38

18

Kentucky Bluegrass Seed May Exceed Demand

Annual survey of seed producers prior to harvest indicates potential oversupply of Kentucky bluegrass and spot shortages of fescues and ryegrasses.

24

Deck Construction Strong Despite Economy

Landscape contractors show that all is not lost by a falloff in new construction. Decks are elements of the landscape logically provided by contractors.

28

Tree Defenses Studied By Forest Service' Shigo

Dr. Alex Shigo, the man who brought you the theory of tree compartmentalization has found evidence that energy reserves in elms may be related to tree health.

36

Greenbug Aphid Eggs Hatch After Ohio Winter

Dr. Harry Niemczyk confirms theory that this new turf pest overwinters instead of migrates. Natural selection pits the aphid against the contractor.

38

Clematis: Climbing To Brighten Landscapes

Doug Chapman looks into the differences among varieties of Clematis for professional landscapes. This perennial standout fits in low maintenance landscapes.

44

Aquatrols Earns a Role In Water Short World

The 20th Anniversary celebration continues with the story of Aquatrols, a supplier of wetting agents to the landscape industry.

DEPARTMENTS

Outlook ____ 6
Green Industry News ____ 8
Golf Update ____ 12
Landscape Update ____ 14
Government Update ____ 16
Vegetation Management ____ 50
Letters ____ 52
Products ____ 55
Events ____ 64
Classifieds ____ 66
Advertiser Index ____ 68

Robert L. Edgell, Chairman; Richard Moeller, President; Lars Fladmark, Executive Vice President; Arland Hirman, Treasurer; Thomas Greney, Group Vice President; Ezra Pincus, Group Vice President; Larry Witchel, Group Vice President; Joe Bilderbach, Vice President; James Gherna, Vice President; George Glenn, Vice President; Harry Ramaley, Vice President.

WEEDS TREES & TURF (ISSN 0043-1753) is published monthly by Harcourt Brace Jovanovich Publications. Corporate and Editorial offices: 757 Third Avenue, New York, New York 10017. Advertising offices: 757 Third Avenue, New York, New York 10017 and 111 East Wacker Drive, Chicago, Illinois 60601 and 3091 Maple Drive, Atlanta, Georgia 30305. Accounting, Advertising Production and Circulation offices: 1 East First Street, Duluth, Minnesota 55802. Subscription rates: $15 per year in the United States; $18 per year in Canada. All other countries: $40 per year. Single copies (prepaid only): $2 in the U.S.; elsewhere $4.50; add $3.00 for shipping and handling per order. Second class postage paid at Duluth, Minnesota 55806 and additional mailing offices. Copyright © 1982 by Harcourt Brace Jovanovich, Inc. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the publisher. Microfilm copies of articles are available through University Microfilms, International, 300 N. Zeeb Road, Ann Arbor, Michigan 48106

POSTMASTER: Send address changes to WEEDS TREES & TURF, P.O. Box 6198, Duluth, Minnesota 55806-9898. HBJ A HARCOURT BRACE JOVANOVICH PUBLICATION

Nitroform®
paints a pretty picture

Nitroform® provides a consistent 38% nitrogen that's released by soil bacteria slowly and predictably — *just when it is most needed to make turf and ornamentals green and healthy. And Nitroform continues this slow, steady release to sustain growth for over six months (even during periods of sparse rainfall).*

You'll find Nitroform nonburning, nonstreaking, nonleaching. It's easy mixing and clean handling, too. This versatile nitrogen source is available in Blue Chip® for dry applications, Powder Blue™ for liquid use, and it can be mixed and applied with insecticides and fungicides.

When you're buying a complete fertilizer be sure to check the label to see that it contains Nitroform, the most efficient source of Water Insoluble Nitrogen.

Nitroform can do beautiful things for your business.

™

For Quality Nitrogen NITROFORM ™

BFC CHEMICALS, INC.
4311 LANCASTER PIKE, WILMINGTON, DE 19805

Circle No. 104 on Reader Inquiry Card

How many turf in this
Here's a clue. D·z·n® Diazinon® controls every insect you see here, from the root-eating white grub to the juice-sucking chinch bug. In fact, D·z·n Diazinon has the biggest label of any turf insecticide. And that makes it the perfect choice for broad spectrum control in both commercial and residential turf.
Need another clue? D·z·n controls damaging worms including
© 1982 Ciba-Geigy Corporation.
Circle No. 108 on Reader Inquiry Card

insects are hiding
picture?
cutworms, sod webworms and armyworms. Plus it takes care of nuisance pests like ants, fleas and chiggers.
We've mentioned 8 species on the label but that's not even half.
Keep counting. And when you place your next insecticide order, ask your supplier for the biggest label in the business—D·z·n Diazinon.
PS: You'll find the answer below.
CIBA—GEIGY
Answer: D·z·n Diazinon controls all twenty-three insects seen here.

WT&T

OUTLOOK

By Bruce F. Shank, Executive Editor

Lean, mean advisory machine

Effective April 1, 1982, five well-known figures in the landscape industry will review magazine plans and content for usefulness. We want you to know we check material before publishing it so that you can trust it and use it. We are, after all, drawing from a tremendous variety of sources to provide a comprehensive landscape publication. The board, representing segments of the industry, will steer us in the right direction and keep us on course.

The first board member is **Euel Coats,** Mississippi State University's weed scientist and, until recently, executive director of the Southern Turfgrass Association. He has served on the GCSAA Educational Advisory Board, the teaching staff of the PGA Business School, and MSU's Turfgrass Short Course as director. He also does irrigation installation on the side.

West Coasters know **Kent Kurtz,** professor of ornamental horticulture at Cal Poly, Pomona. A specialist in sportsturf, Kent is a transplanted Southern Illinois University graduate with a Ph.D. in horticulture from the University of Arizona. Kurtz has consulted for O.M. Scott & Sons and many major league baseball clubs who practice or are based on the West Coast. He has presented speeches at the GCSAA Show, the International Turf Society Meeting in Canada, and the National Institute on Park and Grounds Management.

Doug Chapman, horticulturist of Dow Gardens, Midland, MI, represents north and north central U.S. A graduate of the University of Massachusetts, Ohio State University, and Michigan State, Doug has intimate knowledge of the region's plant material. Prior to Dow Gardens, Doug was an extension specialist in the Flint, MI, area for more than seven years. He is a member of the International Society of Arboriculture, the American Horticultural Society, the American Society of Horticultural Sciences, the International Plant Propagators of America, and the American Association of Botanical Gardens and Arboreta. His extension background gives him that holistic approach to landscape problem solving.

Roger Funk, author of the Vegetation Management column each month and vice president of research and development for Davey Tree Expert Co., Kent, OH, is also a problem solver by nature. Funk has a doctorate from West Virginia University. There is little he hasn't had to solve for both Davey Tree and Davey Lawnscape in his eight years there. He holds the patent to Arbor Green, a slow-release organic fertilizer, and a no-drift spray nozzle.

Finally, when you think of applied entomology in the U.S., you have to think of **Harry Niemczyk,** professor of entomology for Ohio State University at its research and development center in Wooster. Niemczyk recently published the only book devoted entirely to turf insects and their control. Harry received his Ph.D. from Michigan State University and is very active with the American Entomological Society, the American Society of Agronomy, and the Ohio Turfgrass Foundation.

Lean and mean. A small board of hard workers who are deeply involved in the landscape market. This group of professionals will work for you through the magazine. Please write to them at our New York office with any of your suggestions or questions. They are ready to put their expertise to use in the pages of *Weeds Trees & Turf.* **WTT**

Coats

Chapman

Kurtz

Niemczyk

Funk

WT&T

Executive Editor
Bruce F. Shank, New York

Associate Editor
Thomas Paciello, New York

Assistant Editor
Robin Richards, New York

Publisher
Dick Gore, Atlanta

Group Vice President
Tom Greney, Chicago

Group Publisher
Robert Earley, New York

Production Manager
Mary Lindskog, Duluth

Production Supervisor
Marilyn MacDonald, Duluth

Graphic Design
Dave Johnson, Duluth

Circulation Manager
Kristine Benike, Duluth

Directory Coordinator
Patty Rusch, Duluth

Reader Service Manager
Gail Kessler, Duluth

Promotion Director
Linda Winick, New York

OFFICES

ATLANTA
3091 Maple Drive
Maple Center One Building
Atlanta, GA 30305
(404) 233-1817

NEW YORK
757 Third Ave.
New York, NY 10017
Editorial: (212) 888-2563 (or 2892)

CHICAGO
111 East Wacker Drive
Chicago, IL 60601
(312) 938-2344

SEATTLE
1333 N.W. Norcross
Seattle, WA 98177
(206) 363-2864

DULUTH
120 West Second Street
Duluth, Minn. 55802
(218) 727-8511

MARKETING REPRESENTATIVES

James R. Brooks
Atlanta (404) 233-1817

Dick Gore
Atlanta (404) 233-1817

Ron Kempner
Atlanta (404) 233-1817

Robert Mierow
Seattle: (206) 363-2864

Member; American Business Press, Business Publications Audit, National Golf Foundation, American Sod Producers Association, Associated Landscape Contractors of America, National Landscape Association, Horticultural Research Institute.

WE GIVE GREENS THE KINDEST CUT OF ALL.

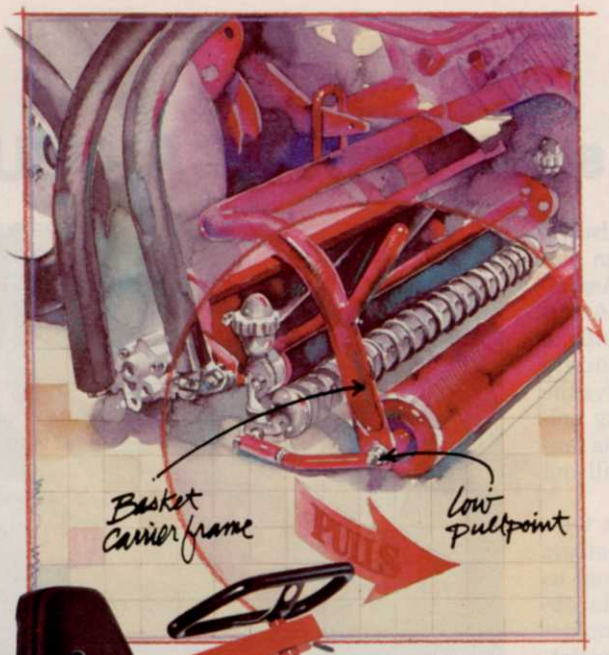
WITH REELS THAT FLOAT.

Toro pulls out the stops to give you the kind of greensmower you want most.

One that keeps you cutting. With a quality of cut second to none.

That's why our Greensmaster 3® is the choice of the majority of America's top hundred golf courses.

This fast, agile professional gives each green a uniform cutting height, appearance and playing characteristic.



Because it's the only greensmower in the world with cutting heads isolated from the traction unit and grass baskets.

Our secret is a carrier frame, with low pullpoints, that pulls rather than pushes. Resulting in balanced, fully floating cutting heads that allow the reels to float freely as they cut, unaffected by dips or bumps encountered by other parts of the machine. Or by the weight of clippings in the baskets.

You get the kindest cut of all. Smooth. Even. Consistently superb.

Plus, other features that make the Greensmaster 3 a versatile as well as durable performer. Like quick disconnect cutting heads for easy conversion to thatching or spiking units.

Call your Toro distributor. He'll give you more good reasons to choose our Greensmaster 3. The greensmower that proves Toro quality doesn't cost, but pays.

TORO®

THE PROFESSIONALS THAT KEEP YOU CUTTING.

"Toro" is a registered trademark of The Toro Company
8111 Lyndale Ave. So., Minneapolis, Minnesota 55420.

Circle No. 137 on Reader Inquiry Card

GREEN INDUSTRY NEWS

LANDSCAPE

Contractors slosh thru ALCA/OSU Field Days

Student and professional landscape contractors grappled with design and maintenance problems at the Associated Landscape Contractors of America Annual Field Days held recently at Oklahoma State University. Industry members had three days to observe the students from nine participating colleges as they competed in contests ranging from residential design to ball and burlap.

ALCA President Ray Gustin welcomed students and industry members who had come from as far away as Michigan, Ohio and Colorado to observe and judge the weekend's activities. The following day, a drizzling Saturday, the competitions were held at the OSU Agricultural Hall.

The competitions included residential design, maintenance estimation, identification of plants, weeds, turf and diseases as well as a mock sales presentation. Schools entered a few representatives in each event to gain points for the overall team rankings as well as the individual "superstar" award.

In the residential design, cut and fill, and maintenance estimation competitions, students were presented with a problem and the information necessary to design a solution in a one or two hour period. Their teammates, in another room, were taking a few short minutes to familiarize themselves with a completed residential design and then prepare a sales presentation for two judges playing the parts of prospective customers.

The action paused briefly as the group moved outside to the OSU Arboretum for lunch and the afternoon events. Competing against the clock, students had to deal with a constant rain and deepening mud as they completed the Bobcat obstacle course, irrigation assembly, ball and burlap, and two-man saw contests. Other groups spent the time competing in brick-on-sand, and small engine repair competitions.

Students raced a Bobcat loaded with sand through an obstacle course to gain points at the ALCA Field Day.

Total points were tallied and kept secret until the awards breakfast on Sunday. When the envelope was opened, Oklahoma State was the overall winner, followed by Mississippi State and Ohio State. Two-year programs made an excellent showing against the other four-year colleges, coming in fourth and fifth in the total points. Bob Buswell of Oklahoma state won the Superstar Award.

The weekend ran smoothly thanks to the efforts of ALCA secretary Irv Dickson and the help of OSU professor Jerry Walkup and the OSU student ALCA chapter. ALCA financed the chapter primarily through the registration contributions of the participants, and registration showed the highest professional participation of any of the past six annual events. Over 40 members of various firms had taken time out of their busy season come to the Field Day.

All seemed to believe that it was time well spent. Many of the students had an opportunity to learn more about the industry and meet potential employers. The last event of Saturday's schedule was a cocktail party to provide a catalyst for students and professionals to get together. According to many graduating seniors and professionals, the weekend was as productive as it was fun. Most of the industry members left the Field Day impressed by the quality of the students and many of the students left with invitations to visit firms for more in-depth interviews.

TREES

Arborists flock to NAA convention

The National Arborist Association had a record attendance at its 1982 Annual Meeting in Hawaii. Over 290 people travelled to the Maui Surf Hotel to participate in the four-day meeting. The board of directors and members cov-

Continues on page 12

A wealth of instructional and technical material designed to make your job easier

Bookstore

101, 015 - ADVANCES IN TURFGRASS PATHOLOGY $27.95 hardcover, $18.95 paperback
340 - CONSTRUCTION DESIGN FOR LANDSCAPE ARCHITECTS $24.50
345 - COST DATA FOR LANDSCAPE CONSTRUCTION 1981 $24.95
410 - DISEASES & PESTS OF ORNAMENTAL PLANTS $26.50
660 - DISEASES OF SHADE TREES $23.50
610 - DISEASES OF TURFGRASS $30.00
795 - FIRST AID MANUAL FOR CHEMICAL ACCIDENTS $16.50 paperback
440 - FUNDAMENTALS OF ENTOMOLOGY & PLANT PATHOLOGY $22.00
450 - GARDENING IN SMALL PLACES $7.95
455 - GRAFTER'S HANDBOOK $16.95
480 - GREENHOUSE MANAGEMENT FOR FLOWER AND PLANT PRODUCTION $15.35
490 - GREENHOUSE OPERATION & MANAGEMENT $19.95
670, 680 - GUIDE TO TREES $19.95 hardcover, $8.95 paperback
350 - HANDBOOK OF LANDSCAPE ARCHITECTURAL CONSTRUCTION $48.50
360 - HOME LANDSCAPE $18.95
510 - HORTUS THIRD $99.50
690 - INSECTS THAT FEED ON TREES & SHRUBS $42.50
530 - INTERIOR PLANTSCAPING $28.50
540 - INTRODUCTION TO FLORICULTURE $29.50
335 - LANDSCAPE DESIGN THAT SAVES ENERGY $9.95 paperback
370 - LANDSCAPE OPERATIONS: MANAGEMENT, METHODS & MATERIALS $18.95
380 - MANUAL OF WOODY LANDSCAPE PLANTS $19.00
545 - MODERN WEED CONTROL $19.50
665 - OXFORD ENCYCLOPEDIA OF TREES OF THE WORLD $24.95
780 - PARK AND RECREATION MAINTENANCE MANAGEMENT $18.95
355 - PERSPECTIVE SKETCHES $19.50
390, 395 - PHOTOGRAPHIC MANUAL OF WOODY LANDSCAPE PLANTS $22.00 hardcover, $14.60 paperback
365 - PLAN GRAPHICS $21.00
700 - THE PRUNING MANUAL $14.95
790 - RECREATION PLANNING AND DESIGN $31.95
375 - SITE DESIGN AND CONSTRUCTION DETAILING $24.00
730 - TREE CARE $8.95
740 - TREE FARM BUSINESS MANAGEMENT $20.50
750 - TREE IDENTIFICATION $9.00
760 - TREE MAINTENANCE $29.95
385 - TREES FOR ARCHITECTURE AND THE LANDSCAPE $11.95
770 - TREE SURGERY $18.95
650 - TURFGRASS MANAGEMENT $17.95
630 - TURFGRASS: SCIENCE & CULTURE $23.95
640 - TURF IRRIGATION MANUAL $22.95
620 - TURF MANAGEMENT HANDBOOK $14.65
110, 120 - TURF MANAGER'S HANDBOOK $23.95 hardcover, $18.95 paperback
565 - WEEDS $32.50
560 - WEED SCIENCE $24.00
570 - WESTCOTT'S PLANT DISEASE HANDBOOK $34.50
580 - WYMAN'S GARDENING ENCYCLOPEDIA $29.95

CLOSEOUTS

ORDER THESE TITLES AT SPECIAL REDUCED PRICES!

420 - EXOTIC PLANT MANUAL $32.00
430 - FLOWER & PLANT PRODUCTION IN THE GREENHOUSE $13.60
460 - GREENHOUSE ENVIRONMENT $21.20
470 - GREENHOUSE GROWER $12.40
500 - HORTICULTURAL SCIENCE $18.80
780 - PARK AND RECREATION MAINTANENCE MANAGEMENT $16.00
550 - PLANT PROPAGATION $21.00
400 WESTERN HOME LANDSCAPING $6.75

Mail this coupon to: Book Sales
Harcourt Brace Jovanovich Publications
One East First Street, Duluth, MN 55802

Name _____
Address _____
City _____ State _____ Zip _____
Signature _____ Date _____
Phone Number _____

Please send me the following books. I have enclosed a check* for the total amount.
Please charge to my Visa, Master Card or American Express (circle one)
Account Number _____ Expiration Date _____

ORDER NUMBER	QUANTITY	PRICE	TOTAL PRICE

*Please add $3.00 per order plus $1.00 per additional copy for postage and handling.

_____ (postage & handling)

Please allow 6-8 weeks for delivery
Prices subject to change.
Quantity rates available on request

Total Enclosed _____

WTT 62

GOLF UPDATE

PGA Tour . . . TPA . . . PGA Tour/TPA

The Tournament Players Association and the Professional Golfers' Association of America have reached an agreement to increase competitive opportunities in golf and to expand marketing and promotion of the game. The highlight of the agreement was the return by TPA to its historic name "PGA Tour." Other facets of the agreement included a cosponsorship by the Tour and the PGA, beginning in 1983, of a $1 million "Tournament Players Series" for players not currently exempt for the PGA Tour, and the formation of PGA, PGA Tour Properties Inc., a new marketing joint venture (similar to NFL Properties).

TPA Commissioner Deane Beman said, "These joint projects between the organization of the game's leading players and the organization of the game's club and teaching professionals should pay real dividends for the future of golf." Joe Black, president of PGA, added, "(the agreement) will benefit both organizations financially, but, more importantly, will help create new interest and competitive opportunities in the game."

Last year the Tour changed its tradename to TPA because of legal restrictions on its ability to use the name 'PGA Tour' in a marketing program. "PGA was able—through the cooperation of Robert MacNally, president of PGA Golf Co.—to renegotiate a long-term contract that perviously had blocked the Tour from using the initials 'PGA' in marketing or licensing agreements," said Robert Oelman, chairman of the Tour's Tournament Policy Board. "That got us over our biggest hurdle and allowed the two groups to pursue a consolidated marketing plan."

Snyder named ASGCA president

Arthur Jack Snyder was elected president of the American Society of Golf Course Architects at the group's annual meeting in Palm Beach, FL.

Other newly-elected officers include Ted Robinson, Westlake Village, CA, vice president; Michael Hurdzan, Columbus, OH, secretary, and John Watson, Lachute, Quebec, Canada, treasurer.

Snyder received his degree in landscape architecture from Penn State. He has been both a golf course superintendent and architect during his long career in golf.

A voice against stimpmeters

While the contributions of the USGA have been universally applauded by golf course superintendents, occasionally a voice of protest rings out. Julius Albaugh, GCS, Westmorland Country Club, Chicago, IL, writing in *The Bull Sheet*, makes his case against the use of stimpmeters. Albaugh's bone of contention is not that the stimpmeter doesn't work, but that it works too well. He notes that information contending faster putting surfaces equals higher quality greens has gotten into the hands of amateurs. "All they feel they need is a stimpmeter and they feel that they can judge quality putting turf," explained Albaugh. "They have no agronomic knowledge of soils, turfgrass varieties, or stress conditions, but base base their opinions totally on the stimpmeter, a table and readings."

Albaugh notes that Chicago-area superintendents alter their management practices according to turfgrass variety, soil and weather conditions. "These practices to produce a desirable putting turf are not based on a set stimpmeter reading, but instead on our agronomic and greenskeeping ability to provide our memberships a uniform, true, healthy and green putting surface," asserts Albaugh. "No where do we find a plant (putting green turf) put under such stress, and now we have the stimpmeter to stress out golfing turf further. I cannot help but feel stimpmeters are anti-grass."

NEWS *from page 8*

ered association business, elected new members and directors while finding time to tour the island and appreciate their surroundings for a few days.

On the first day of the conference, members and board met to review and approve the applications of new members. Erik Haupt was elected president for 1983 and the new board of directors was chosen. Several activities were approved, including the creation of a National Arborists/Paul Tilford Foundation, in honor of the NAA's first executive secretary, to fund projects of special interest to the membership. The membership also granted approval for the production of a newsletter for field personnel.

A trade show will be held in conjunction with the 1983 Annual Meeting in New Orleans. The members requested one since the entire attendance at the meeting is a buying market.

The Board decided to hired another part-time staff member, to service the prevention engineering aspect of the insurance program that the NAA is contracting.

Educational sessions were given by ten speakers. To enhance the audience participation during the talks, microphones were provided for each question from the floor. Talks included topics such as insurance, problems and solutions, tools for tree care, pest management and diversification. Each speech was professionally taped. Cassettes can be obtained from Crown Duplication, P.O. Box 1147 Aiea, HA 96701.

TURF

TUCO awards five turf scholarships

Three seniors at Michigan State University and two at Texas A & M University have received TUCO turf scholarships. Stephen Meyer, Chad Ball and Thomas Lively of Michigan were presented their awards by TUCO representative Russ Tiller at the Michigan Turfgrass Conference. Texas students, Randy Broyles and Michael Yarotsky were presented their scholarships by James Lipari, TUCO sales consultant.

TUCO, the agricultural division of the Upjohn Co., offers the scholarships to students in ten participating universities. The recipients are judged by the university faculty on academic performance, personal character and dedication to a turf career. Since beginning the program in 1974, the company has generally given 10-15 scholarships a year.

Continues on page 14

TO THOSE WHO HAVE NO CHOICE BUT TO ECONOMIZE:

A CHOICE.

Nobody understands the budget squeeze you're feeling better than Cushman. After all, getting the most work out of every manhour is something we've specialized in for years.

Take the two vehicles below, for instance. On the left is the Cushman Runabout. With an 18-hp OMC engine, it seats two workers and hauls up to 1500 pounds of cargo. A new centrifugal clutch is standard, which allows the driver to stop and go without shifting. And a 12-hp model offers even greater economy as well as easy handlebar steering.

On the right is the new Cushman Turfcart.™ A 7-hp engine is an economical way to get your crew off their feet and moving. Flip up its rear passenger seat and you've got room for tools, supplies and equipment.

Either way, Runabout or Turfcart, you'll get a vehicle that's easy on gas and easy on the budget.

For the location of your nearest dealer, call 402-435-7208.

CUT 2-5079

Outboard Marine Corporation, 1981. All rights reserved.

Send to: 5009 CUSHMAN, P.O. Box 82409
Lincoln, NE 68501

☐ Please send me the 1982 catalog of the Cushman turf-care system.

☐ Please ask my Cushman Dealer to contact me for a free demonstration of the Runabout or Turfcart.

NAME

FACILITY

ADDRESS

CITY

STATE/ZIP

CUSHMAN.® THE WORKING SYSTEM.

Circle No. 110 on Reader Inquiry Card

LANDSCAPE UPDATE

LA report assesses the future

The American Society of Landscape Architects Task Force has published "Landscape Architecture into the 21st Century." This 100-page report covers the political, social, economic, and technological forces of change which will impact the profession and predicts the future practice opportunities of the landscape architect.

One of the points the report makes is that house sizes will reduce dramatically. Some other assertions include: More and more housing units will be built to accommodate the single liver (perhaps as much as 50% of all new and renovated housing units during the next 10 years); land use density will increase and construction of conventional single family homes will show dramatic declines; and rehabilitation of existing housing structures will rapidly out-pace construction of new units.

The Task Force was created by Immediate Past President William Behnke and was chaired by Past President Lane Marshall, the report's author and editor. Jot Carpenter, Cameron Man, Don Olson, David Racker, Grant Jones and David Wright served with Marshall during the year-long research effort.

Folder explains tree value to consumers

The Council of Tree and Landscape Appraisers has produced a colorful folder on the investment value of trees and other landscape plants. The folder is designed as an aid to tree, nursery and landscape professionals in informing their customers on the important dollar value of their trees and shrubs. The folder also explains exactly what events are normally classed as "casualties" by insurance companies and tax officials. The steps a homeowner can take if casualty strikes are spelled out—in terms of insurance coverage, tax deductions, or civil damage claims.

The folders are designed with space to permit an individual firm to have its name imprinted and distributed to the general public or homeowners. Copies are available in any quantity at 10¢ each by contacting The Council of Tree and Landscape Appraisers, 232 Souther Building, Washington, DC 20005.

Twelve contractors win ALCA Safety Awards

The Associated Landscape Contractors of America named 12 landscape contracting firms recipients of the 1981 ALCA Safety Awards for Accident Prevention. The awards were made in categories, according to the total number of man-hours worked over the twelve months of the contest (September 1, 1980, through August 31, 1981). Participating landscape contractors reported monthly on the number of time-lost accidents and labor time lost, during that month.

The winners of the 1981 Safety Award for Accident Prevention were: John Lamm of Jackson, Midwest Landscape Co., Francis J. Wolfe Jr. Landscape, Brazos Valley Nursery, Southern Seeding Service, Stano Landscaping, Landplant, Kujawa Enterprises, Nelson Landscape Service, Brickman Industries, Theodore Brickman Co., and Lawrence & Ahlman.

In addition the 1981 Safety Award winners, five firms were cited for perfect safety records: Aristorcrat Landscaping, James Ranches Landscape, Skoog Landscape, Village Landscape Maintenance, and Clearwater Landscaping.

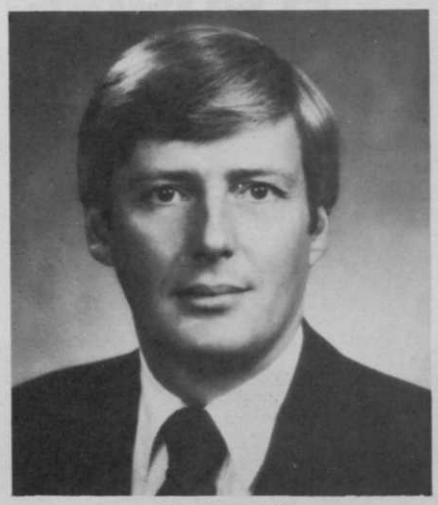
NEWS *from page 12*

EQUIPMENT

West promoted at Cushman

OMC Lincoln has named Scott West III general manager of Cushman Motor Sales, Cerritos, CA, where he will be responsible for all marketing and administration of the company-owned outlet. He will handle Cushman industrial and turf care equipment along with the Ryan brand of turf maintenance units.

West joined OMC Lincoln in 1975 in the Cushman vehicle marketing department, followed by a position in the



Scott West III

Lawn Boy marketing force. In 1977, he was promoted to district sales manager for Cushman and Ryan product lines and then to advertising/sales promotion manager for all OMC Lincoln product lines.

According to Frank McDonald, OMC Lincoln marketing director, West's experience in revamping and strengthening service operations of dealerships will be valuable in the large southern California outlet.

CHEMICAL

Diamond Shamrock names Mitchell VP

Kenneth Mitchell has been appointed as the vice president in charge of agricultural chemicals for Diamond Shamrock Corp., Cleveland, OH. Mitchell will have all responsibility for specialty chemicals, agricultural chemicals, animal health, process chemicals, ion exchange and metal coatings businesses. Mitchell was previously vice president and general manager of the process chemicals division.

Sitting duck.

There's a new way to turn burrowing rodents into sitting ducks. But it's a product that has been around for a long time.

It's called **Phostoxin.**®

Phostoxin is a well-known pest control agent. For years, it has been used to eliminate insects from grain and food storage areas. And now, with a new label, Phostoxin can help you get rid of underground pests...like Norway rats, roof rats, house mice, ground squirrels, moles, voles, gophers, chipmunks, marmots, woodchucks and prairie dogs.

You know the nasty reputations of these burrowing pests. In just a matter of days, they can inflict thousands of dollars of damage and contamination.

That's why you want to do away with them quickly and safely.

Phostoxin is **easy to use.** Simply apply the tablets and seal the burrow. As the tablets decompose, they release lethal concentrations of hydrogen phosphide. And every rodent in the burrow becomes a sitting duck.

Certified applicators have found Phostoxin to be **safe and effective**. It is applied out of doors, as a solid-form, delayed-release fumigant. As a result, gas masks are rarely used, although proper respiratory protection must be available.

Phostoxin is **economical**. Many people have been able to get rid of their underground pests for just pennies per burrow.

Phostoxin can help you turn rats into sitting ducks. For more information, contact your Degesch representative:

Fumigators, PO Box 33342, Raleigh, NC 27606, Phone 919-832-3983; **Industrial Fumigant Company**, PO Box 1200, Olathe, KS 66061, Phone 913-782-7600; **J-Chem**, PO Box 5421, Houston, TX 77012, Phone 713-923-9401; **Lystad's**, 901 University, Grand Fork, ND 58201, Phone 701-775-6283 or 7220 Claussen Blvd., Oklahoma City, OK 73116, Phone 405-843-5876; **Van Waters and Rogers**, 2600 Campus Dr., San Mateo, CA 94403, Phone 415-573-8000.

DEGESCH

RESTRICTED USE PESTICIDE For retail sale and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's Certification.

Circle No. 112 on Reader Inquiry Card

PORTABLE REELS FOR WATERING, SPRAYING, FERTILIZING, CLIPPING, EDGING, TRIMMING

Hannay Reels on Wheels take hose or power cable straight to the job and back.

No hassle, no hauling, no dragging, no unkinking, no untangling, no piling, and no time-consuming mess.

For more efficient grounds maintenance, specify Hannay Reels for portable hose or cable handling.

HANNAY REELS

CLIFFORD B. HANNAY & SON, INC., WESTERLO, NEW YORK 12193
TELEPHONE (518) 797-3791

Circle No. 117 on Reader Inquiry Card

GOVERNMENT UPDATE

USDA spots another problem insect

Recently the Animal and Plant Health Inspection Service, USDA, intercepted an exotic leafminer of economic importance on chrysanthemum cut flowers from Colombia, South America. As of April, 1982, routine fumigation will be required of all cut flowers from Colombia when leafminers are found upon port of entry inspection. Such a requirement has been in effect for years for all over countries outside North America but Colombia was excluded because no exotic leafminers occurred there. Since it is so difficult to identify immature leafminers, USDA considers all leafminers to be serious pest insects and restricts their entry.

Idaho granted white clover protection

The Idaho Agricultural Experiment Station has just received a certificate of protection for the first variety of white clover ever to be issued. These certificates from the U.S. Department of Agriculture are granted to novel, uniform and stable seed varieties and give exclusive right to reproduce their products in U.S. for 18 years.

EPA opts for rules not politics

The Environmental Protection Agency (EPA) refused to approve the use of ferriamicide on the imported fire ant despite strong pressure from members of Congress from the states infested by the ant. EPA and the U.S. Department of Agriculture will hold a symposium in June to consider any new scientific information which would allow the consideration of granting a conditional use registration for the chemical. Control procedures this year will have to involve chemicals that are registered for fire ant control: Amdro from American Cyanamid Co. and Turcam from BFC Chemicals Inc.

Two new birch tree borer controls

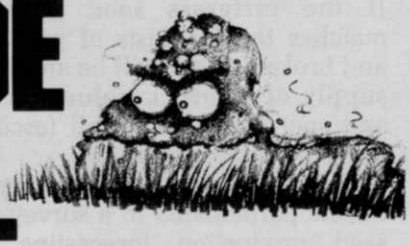
Two years of research at Ohio Research Center (Wooster) indicates that bendiocarb and chlorpyrifos (Dursban) are more effective than lindane for the control of borers in bronze birch and European white birch. Dursban is already labeled for this use and the bendiocarb manufacturers are seeking a "wood boring insect" addition to their Turcan® and Dycarb® ornamental labels. The Ohio State Extension specialists are now recommending that Dursban replace lindane in birch borer control programs.

Spruce budworm control, ocean to ocean

The U.S. Forest Service has decided to use insecticides on 208,000 acres of national forests in fortheast Oregon currently infested with the spruce budworm while about 25,000 acres will be untreated. The final acreage will be determined by the estimated cost of the chemical application and the results of larval sampling. Most of the area will be treated with carbaryl while some sensitive areas will be sprayed with acephate or *Bacillus thuringinsis* (Bt). Across the continent in Maine, the Forest Service will assest financially the silvicultural management of spruce fir stands mixed with hardwoods to lessen the threat from the spruce budworm on 863,000 acres, and IPM suppression measures of using acephate and Bt in buffers around settled areas, environmentally sensitive areas and small ownerships on another 97,000 acres.

NORTHRUP KING PRESENTS

THE HEAVY TRAFFIC, CLEAN MOWING, SALT TOLERANT, DISEASE FIGHTING, SUN-TO-SHADE GRASS SEED.



No one grass seed combines every characteristic for every type of turf. That's why Northrup King research has developed a complete line of Medalist Turf Products to meet specialized professional needs.

MEDALIST TURF PRODUCT	MAJOR AREAS OF USE	SPECIAL FEATURES
Athletic Pro Mix	High maintenance athletic turf	Both are well suited for new seeding or overseeding. Fast establishing, excellent traffic tolerance, and rapid recovery. Provides good footing.
Athletic Pro II Mix	Low to moderate maintenance athletic turf.	
Boulevard Mix	Any area with high pH (roadsides, sidewalks, boulevards, beachfronts, etc.)	Contains both "Fults" *Puccinellia distans* and Dawson red fescue which thrive on high saline or alkaline soils. Performs at low to high fertility levels.
Landscape Pro Mix	School grounds, cemeteries, golf course roughs, lawns	Fast establishing. Adapts to broad range of conditions and management levels. Low to moderate fertility requirements.
Overseeder II Mix	Fairways, tees, athletic fields	Fast establishing, traffic tolerant, disease resistant, penetrates compacted soil.
Overseeder III Mix (Formerly Medalist North Mix)	Fairways, tees, cart paths, wear areas	Long term quality in high traffic areas. Clean mowing and disease tolerant.
Premium Sod Blend	Commercial sod producers	Fast establishing, exceptional dark green color, shade tolerant, superior disease resistance.
Special Park Mix	Parks, commercial developments, lawns	Low fertility tolerance, shade tolerant, adapts to wide range of soil types.

Ask your Northrup King distributor about the Medalist Turf Products for your needs. Or write Northrup King Medalist Turf Products, P.O. Box 959, Minneapolis, MN 55440.

MEDALIST TURF PRODUCTS

Circle No. 127 on Reader Inquiry Card

SEED HARVEST FORECAST

BLUEGRASS OVERSUPPLY LIKELY; RYEGRASS, FESCUE MAKE GAINS

By BRUCE F. SHANK

If the turfgrass seed harvest matches the forecasts of growers and brokers, there will be an oversupply of Kentucky bluegrasses and spot shortages of tall fescues and perennial ryegrasses.

More than 10 major seed producers participated in a survey on seed production forecasting in April. *Weeds Trees & Turf* will poll the same seedsmen in August for harvest results. Rain and disease are the most serious threats to seed production between now and August. Rain while the seed is windrowed in the fields for drying can cause major losses and lack of rain during seed formation can stunt the parent plants. Too much rain at the wrong time can encourage diseases to reduce crop yields.

Seed producers are coping with two major problems, a falloff in construction with a corresponding drop in sales of Kentucky bluegrasses and the increasing popularity of fine-leafed perennial ryegrasses and improved low-maintenance tall fescues. Balancing seed supply with demand is more complicated than it has been in the past for the growers. And it will get more difficult as turfgrasses collected from other hemispheres are brought to the U.S. for commercial production. Collection trips are taking place this year.

Kentucky bluegrasses

Poa pratensis, the backbone of the sod market and lawn installation is suffering from a drop in construction and competition from faster germinating perennial ryegrasses and lower maintenance fescues.

Northrup King's Larry Vetter says demand for Kentucky bluegrass is down while supply is good. Rich Hurley of Lofts says, "We had a good crop last year and another good crop is anticipated for this year." Tom Stanley of Agricultural Services predicts Kentucky bluegrass is entering an oversupply situation which may take a few years to balance supply with demand. Prices may fall as a result. Touchdown is the only Kentucky bluegrass indicated which may be limited by supply.

Fescues

Fescues are the beneficiary of increased attention to maintenance requirements for turfgrasses. Fine fescues (creeping red and chewings) succeed in conditions where Kentucky bluegrasses fail, such as heavy shade and low nitrogen. They fall short on heat tolerance.

Improved tall fescues have solved the heat tolerance problem while retaining the low maintenance advantages and adding a lower moisture requirement. Transition zone turf managers have welcomed improved tall fescues.

As a result, spot shortages of tall and hard fescues are possible this fall and next spring. Seed growers have not been able to increase production of improved tall fescues to keep up with demand. The new tall fescues, such as Mustang, Rebel, Houndog and Falcon, could be hard to find next spring.

Hard fescues, such as Waldina, Reliant, Tournament and Scaldis, are useful for shade locations with lower maintenance required. They too could be short if their popularity continues to increase as predicted.

Ryegrasses

Once considered a less attractive turfgrass with poor mowing characteristics and light green color, perennial ryegrasses have overcome their shortcomings and are giving Kentucky bluegrass a run for its money. Seed scientists have developed darker color, better mowing characteristics and finer leaf structure in perennial ryegrasses. Add these improved characteristics to the seven-day germination period and you have a contender for Kentucky bluegrass.

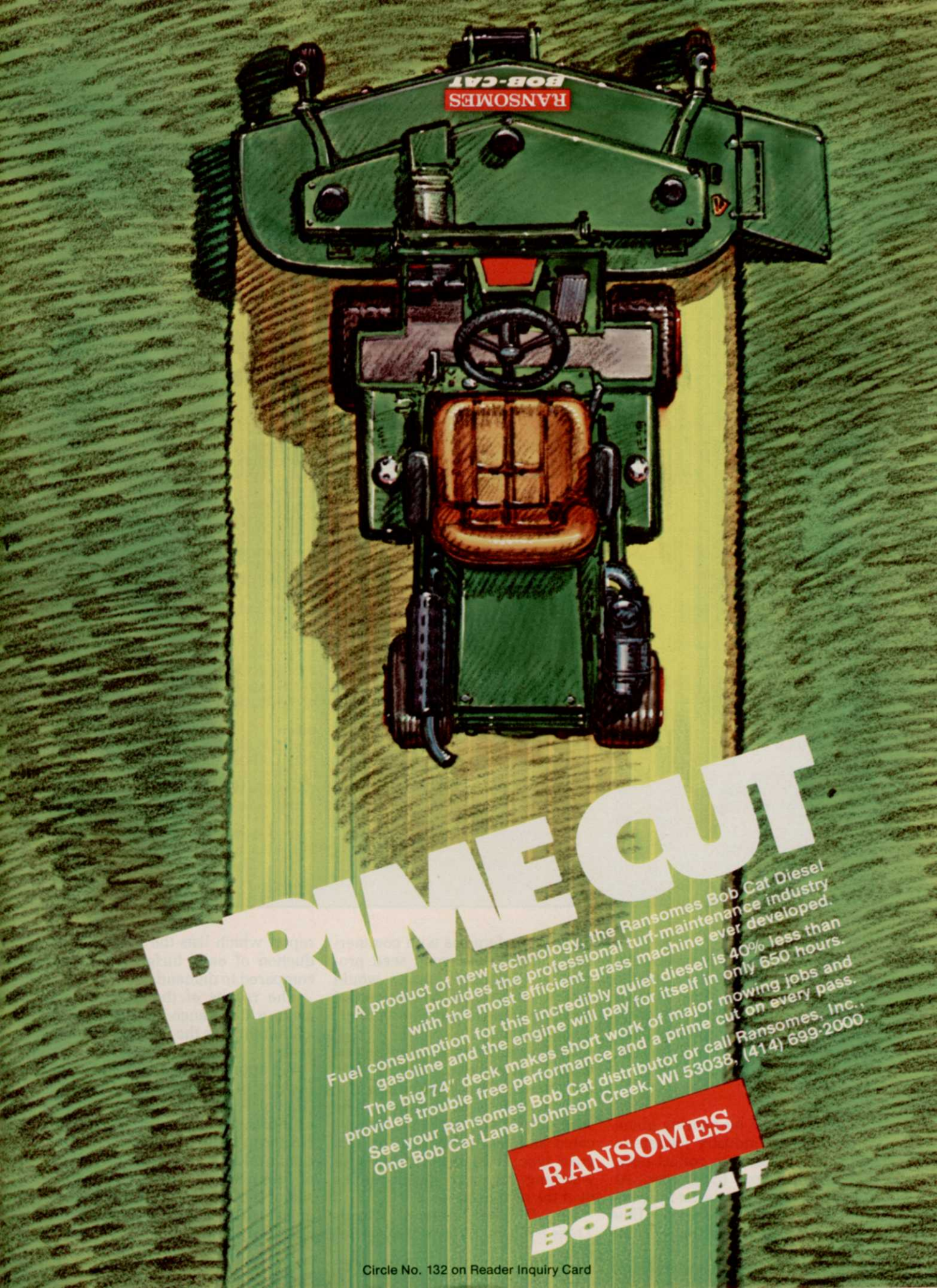
Perennial ryegrass seed production is lagging slightly compared to the extremely high demand. Not as short as tall or hard fescues, perennial ryegrass prices should hold or increase. Stanley, a marketer of ryegrass, predicts, "Perennial ryegrass will overtake bluegrass if the economy improves even though it is almost twice as expensive in some cases."

Rich Hurley feels there won't be enough fine fescues to go around.

Bentgrasses

Another victim of construction, bentgrasses are selling well in the Sunbelt but poor in the North according to Larry Vetter. Demand, as a result, is average for this specialty turfgrass. Penneagle supply may not meet demand this fall and next spring, but any shortage would be minor from our data.

Continues on page 20



Circle No. 132 on Reader Inquiry Card

TABLE 1

Anticipated Seed Production Compared To Anticipated Demand.

Turfgrass Type	Percent Demand Met By Production
Kentucky Bluegrass Varieties	
ADELPHI	100
AMERICA	90
AQUILA	60
A-34 (BENSUN)	92
BANFF	75
BARON	100
BIRKA	100
BONNIE	50
BRISTOL	100
CHERI	100
COMMON	100
ECLIPSE	100
ENMUNDI	100
FYLKING	100
GLADE	100
GEORGETOWN	5
MAJESTIC	23
MERION	100
MERIT	100
NEWPORT	100
NUGGET	53
PARADE	100
PARK	100
PENNSTAR	53
RAM I	100
RUGBY	75
SCENIC	100
SHASTA	100
SYDSPORT	93
TOUCHDOWN	75
VANTAGE	100
VICTA	100
WABASH	80
COLUMBIA	93
Fescue Varieties	
AGRAM CHEWINGS	100
ALTA COMMON TALL	100
ATLANTA	100
BANNER	100
BEAUMONT MEADOW	0
BILJART	100
CHECKER CHEWINGS	100
CLEMFINE TALL	30
CREEPING RED	100
DAWSON RED	55
ENSYLVA	85
FALCON	60
FAWN TALL	100
FORTRESS	90
HIGHLIGHT CHEWINGS	100
HOUNDOG TALL	18
JAMESTOWN	75
K-31 TALL	100
KOKET CHEWINGS	100
OLYMPIC TALL	35
PENNLAWN	100
REBEL	35
RELIANT HARD	10
RUBY RED	60
SCALDIS HARD	80
SHADOW CHEWINGS	100
TOURNAMENT HARD	50
WALDINA HARD	50
BARFALLA CHEWINGS	100
AURORA	LIM
MUSTANG TALL	10
GALWAY	0
Ryegrass Varieties	
ANNUAL	100
BARRY	85
BELLE	50
BIRDIE	100
BLAZER	90
CARAVELLE	100
CITATION	90
COMMON PERENNIAL	100
DASHER	90
PENN FINE	75
DELRAY	80
DERBY	100
DIPLOMAT	100
ELKA	53
FIESTA	50
GOALIE	75
HUNTER	100
JACKPOT	100
LORETTA	100
MANHATTAN	90
NK-200	100
OMEGA	100
PENNANT	95
PREMIER	85
REGAL	100
YORKTOWN	100
YORKTOWN II	95
MANHATTAN II	LIM
ETON	75
PRELUDE	100
PALMER	25
Bentgrass Varieties	
ASTORIA	10
BARDOT COLONIAL	100
EMERALD	100
EXETER COLONIAL	190
CARMEN	100
HIGHLAND	100
KINGSTOWN VELVET	0
PENNCROSS	100
PENNEAGLE	88
SEASIDE	100
Other	
FULTS PUCCINELLIA DISTANS	100
REDTOP POA ALBA	100
REUBENS CANADA BLUEGRASS	100
COMMON POA TRIVIALIS	100
SABRE POA TRIVIALIS	75
BERMUDA	LIM
STREEKER REDTOP	100

LIM = limited

Other Turfgrasses

Redtop production is expected to meet demand since it is also tied to construction. Sabre *Poa trivialis* and Reubens Canada bluegrass will also meet demand. Fults *Pucinellia distans* supplies will be adequate according to Larry Vetter.

The future

You will soon be hearing about trips made by industry leaders to other hemispheres to collect new, low maintenance turfgrasses. At the same time, we have not fully explored our native grasses for fine turf uses. Seed producers must focus on turfgrasses with commercial potential and good seed production. Any new grasses would have to undergo a good ten years of testing before being made commercially available.

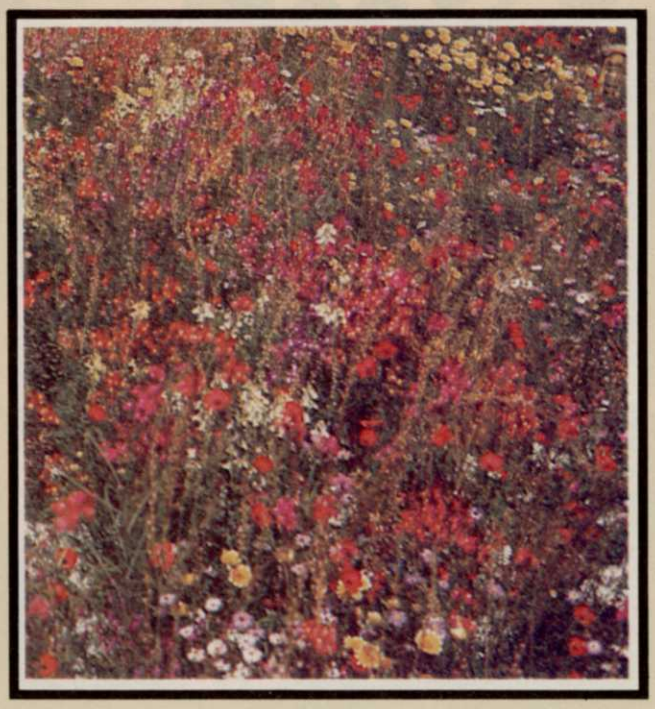
Seed scientists may want to test crossbreeding native and exotic turfgrasses. The possibilities for new turfgrasses are endless. The seed market will get more complicated and less dependent on one grass type. It is an industry worth watching for new developments over the next decade.

The October issue of *Weeds Trees & Turf* will have the harvest report which lists the precise production of each turfgrass type as compared to demands.

The results of the harvest can make a difference in pricing and availability for the fall and coming year.

We appreciate the help of Doyle Jacklin of Jacklin Seed Co., Jay Glatt of Turfseed Inc., Rich Hurley of Lofts Seed, Larry Vetter of Northrup King, Tom Stanley of Agricultural Services, Harry Stalford of International Seeds, Bob Peterson of Burlingham, and Bob Russel of J&L Adikes, and Joe Butwin of Stanford Seed. **WTT**

Create a Colorful Difference



WITH

Pinto BRAND WILD FLOWER MIX . . .

the colorful and decorative answer for low maintenance landscape areas.

Multi-colored blends of annuals and perennials like Chicory, Scarlet Flax, Bachelor's Button, Baby's Breath and Painted Daisy. A blend that reseeds itself for lasting beauty year after year.

Pinto is ideal for any landscape — parks, roadsides, golf course roughs, home gardens, industrial and landfill sites. And perfect for areas where you don't have to mow.

Available either as 100% wild flowers, or mixed with a fescue as a Meadow Mix to aid soil stability.

It's custom blended in a Northern or Southern mix. So wherever you live, your Pinto order will be perfectly adapted for your climate. It will make this year the start of many colorful years to come.

Pinto Wild Flower Mix: the easy, low-maintenance way to naturalize your surroundings.

For more information or to place your Pinto order, call:

- **Ray or Lance Bentley, Lofts/New York (518) 677-8808**
- **Tim Bowyer, Sunbelt Seeds, Inc. (404) 491-1311**
- **John Sours or Grant Jurgensen of Jacklin Seed Company (208) 773-7581**

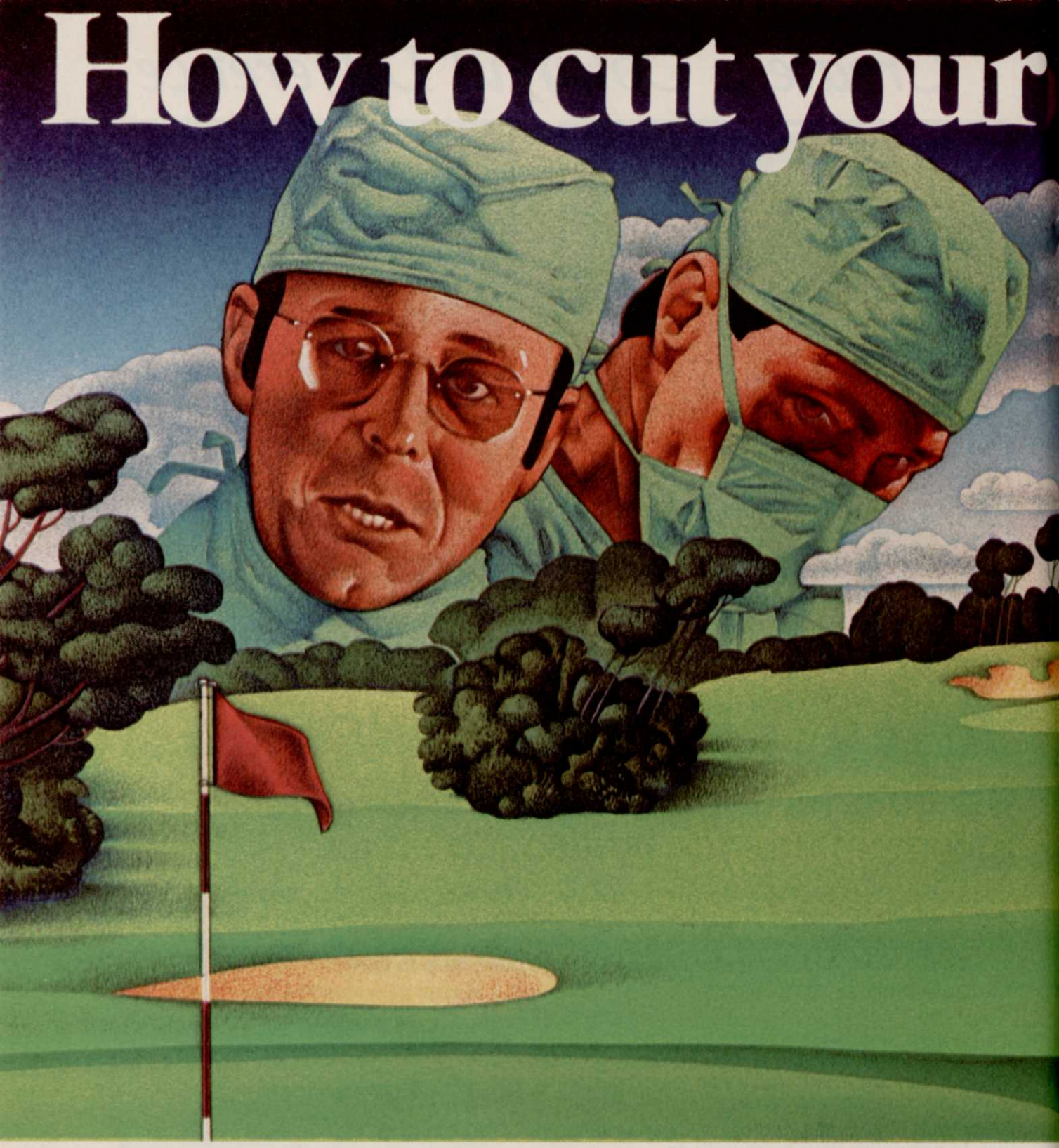
LOFTS

Lofts Seed Inc.
Bound Brook, New Jersey 08805

Jacklin Seed Company
Post Falls, ID 83854

Circle No. 122 on Reader Inquiry Card

How to cut your



Long-lasting Chipco® 26019 fungicide is as good for your budget as it is for your turf.

Because it gives you the longest residual activity, you'll need fewer treatments on greens and tees with Chipco 26019. And fewer treatments on fairways, where it controls diseases longer...from 21 to 28 days. So for every treatment you eliminate thanks to Chipco 26019, you'll save up to $10 an acre in fuel and labor!

And Chipco 26019 is strong medicine. No other fungicide gives better control of the major turf diseases. Chipco 26019 is effective on Helminthosporium

operating costs.

Please read label carefully, and use only as directed.

Leaf Spot and Melting Out, Dollar Spot (including benomyl-resistant), Brown Patch, Fusarium Blight, Fusarium Patch (Pink Snow Mold), and Gray Snow Mold.

For healthier turf on greens, tees and fairways — plus a healthy cut in operating costs — control diseases with long-lasting Chipco 26019. It's just what the doctor ordered.

Rhône-Poulenc Chemical Company, Agrochemical Division, Rhône-Poulenc Inc., Monmouth Junction, NJ 08852. RHÔNE-POULENC

CHIPCO 26019.
It's strong medicine.

Circle No. 133 on Reader Inquiry Card

Planking *designed to steer people from one area to another is the trademark of a Ridge Nurseries deck.*

DECK CONSTRUCTION

LANDSCAPERS BUILD AS HOME PURCHASES

Piano-shaped deck *is set on I-beams in a cement base. Doerler Landscaping used this method instead of the wooden joist arrangement due to insufficient depth.*

High interest rates. Reaganomics. Tight money. While these terms often herald bad times for the new construction market, many landscape contractors have found their deck construction business on the upswing.

"About 70% of the deck jobs that we do are additions to previously built homes," said Bill Kourbage, Ridge Nurseries, Dix Hills, NY. Other contractors contacted by *Weeds Trees & Turf* agreed that the majority of their deck and wood structure work was in additions. High interest rates have dissuaded many home owners from new home purchases and steered them instead into improvement of their current home.

Landscape Architect Steve Ownby told *WTT*, "There is a lot of interest in decks. I find that people

Bracing *of the bench to the deck is one of the many areas that lend itself to innovative and unique designs.*

MORE DECKS TUMBLE

By THOMAS PACIELLO

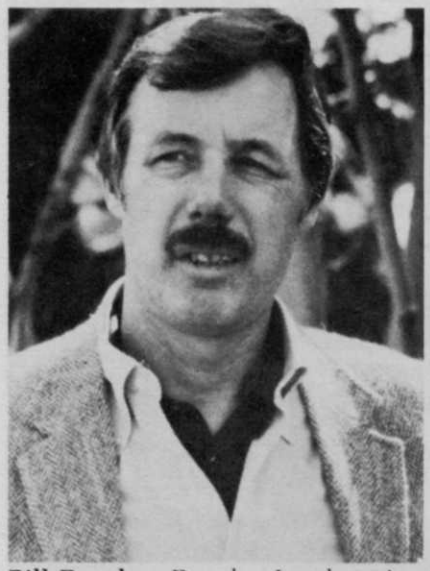
are doing a much better job of developing their residential environment." As in most construction jobs, communication between the design and contracting personnel is vital and many contractors are centralizing both tasks. Bill Doerler, Doerler Landscaping, Lawrenceville, NJ, employs four landscape architects who serve as salesmen, design consultants and on-the-job supervisors. "With much of our work, we try to design, build and maintain the entire entertainment area as opposed to simply building a deck," said Doerler.

One Doerler job that *WTT* visited illustrated this point. A greenhouse opened out onto a piano-shaped deck. The shallowness of the area in which the deck was built posed a problem. Doerler opted to set steel I-beams in a concrete base to support the deck structure. Off of the deck is the pool and the rest of the entertainment area. Wood structures are present in many forms in this area. Railroad ties serve as hedge borders on two sides of the pool and on a third side are used as the base of two vegetable gardens. A wooden fence conceals the pool's pump and filter and a three-cell compost heap is constructed with removable wooden slats for easy usage as its volume changes. The pool was the only segment of the area that was subcontracted.

Indeed, many landscape contractors believe that the greater their capabilities, the greater their ability to suggest work that might be overlooked. "We design everything on the outside of the house, deck, pool, tennis courts, everything," said Kourbage. "Some of the work is subcontracted, but the key is for you to be the one person the homeowner deals with." Kourbage explained that the homeowner is much more comfortable with having one person to explain their ideas to and one person to be responsible for the work. "Being the key person enhances your reputation which in turn helps your business," added Kourbage, who does not advertise.

The majority of landscape contractors contacted by *WTT* did little or no advertising to promote their deck construction capabilities. "Advertising did not pay off for me," said William Beitz, William Beitz and Associates, Stillwater, OK. "My work basically comes from word-of-mouth." Many con-

Continues on page 26



Bill Doerler, *Doerler Landscaping, Lawrenceville, NJ, employs four landscape architects who design "total entertainment areas."*

tractors hold firm the belief that the best advertisement is an attractively-designed and well-constructed landscape. Professional contacts is one area that should not be overlooked. Professionals with different specialties are sometimes in the position to call on one another's services. Ownby (whose specialty is new construction design) has hooked up with Beitz (whose work is basically renovations) in the past when he needed remodel contracting. "Professionals need to consult each other on an ongoing basis to do the best possible job," said Beitz.

Design details

On the subject of design details, landscape contractors varied widely. "Anyone can build a square deck," said Kourbage. "We never do the same job twice. Some of our designs are still in style ten years after they're built." The challenge of coming up with new and unique designs was one of the common threads among landscape contractors. The Kelly residence was a job designed by Ownby and contracted by Beitz. The home was a subdivision of a golf course and part of a semi-urban environment. "The back of the home opened out into a densely-wooded area," said Ownby. "You felt like you were walking out of a treehouse. There was also a very steep grade." Ownby said that the challenge was to preserve the naturalness of the site. He also had to solve the problem of the grade. The "ground" floor of the front of the house was actually the second floor of the rear of the house. Ownby designed two levels of decks. The upper level wooden deck leads you down to the lower deck which is comprised of a pool bordered by redwood decking on one side and stone decking on the other. A curved, stone staircase leads into the pool and stone tree basins were constructed to integrate the wooded environment with the deck. Beitz subcontracted both the pool and masonry work.

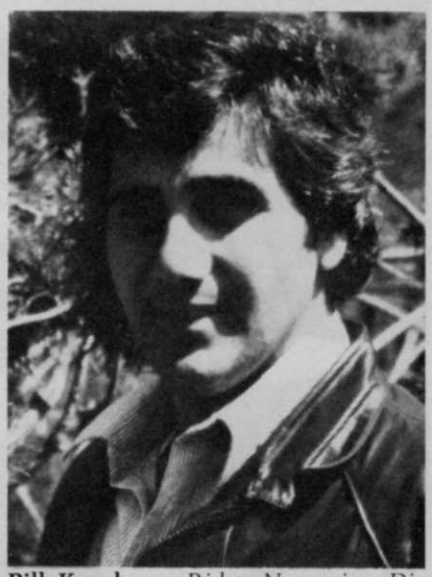
Tiering

Ridge Nurseries tries to avoid stairs whenever possible and use tiering instead. "With tiers you can get different uses out of the same structure," said Kourbage. "What serves as a bench on one level can serve as a step to another and replace the need for stairs." Another Kourbage trademark is sophisticated planking. Kourbage explained that by angling planking you can steer people into various sections of the entertainment area. This is a subtle technique that is particularly effective when tiers (instead of stairs) are employed.

The types of materials used and how they are employed varied from region to region. Landscape contractors in some areas found redwood to be prohibitively expensive. Some contractors told *WTT* that, especially for visible areas, redwood was worth the expense. "It's practically maintenance-free and stands the test of time,"said one northeastern contractor. More contractors are also opting for concrete footings instead of railroad ties. "With concrete footings we feel we give the structure a sense of permanence," said Kourbage. "With railroad ties you're never sure if they'll settle or erode."

Building Codes

The majority of contractors told *WTT* that they do their work according to current building codes. "The only time we have to comply with building codes is when we're putting up an overhead structure or the work involves utility lines," said Beitz. Taking it one step further, one New York contractor said, "We do all our work according to code because oftentimes



Bill Kourbage, *Ridge Nurseries, Dix Hills, NY, (whose business is concentrated in Long Island's "Gold Coast") averages close to 15 deck jobs a year.*

homeowners will call us years after we have completed a job and say they want to sell the house and does the work that we performed meet the building permit standards."

While earth-moving equipment is occasionally used, particularly when steep grades are involved, deck construction typically requires few elaborate tools. Most contractors use standard carpentry tools, some power tools (saws, drills) and an auger. A few contractors commented on realizing how dependent they have become on power tools when they were forced to use standard tools on decks where there were no electrical hook-ups.

While the economy has hurt some construction, many landscape contractors are moving full speed ahead with their deck construction. The average contractor surveyed by *WTT* planned to build 10-15 decks per year costing $20,000 per unit. That price tag is misleading though, taking into account $40,000 jobs in suburban New York and $5,000 jobs in rural Oklahoma.

"During the gasoline crisis in the early 1970's people stayed home, did less travelling and subsequently wanted a 'total environment' on their property," said Kourbage. "That is when our deck business started to pick up and I see the same thing happening again." A lot of landscape contractors who do deck construction hope he is right. **WTT**

Subdue.

Controls Pythium blight and damping-off.

No other fungicide works as well as Subdue® against Pythium damping-off and blight because only Subdue has two-way action against these diseases.

First, Subdue gives you systemic control that protects grasses from the inside out. Second, it works in the soil to control Pythium by contact action. Two-way action that keeps turf healthy.

In established turf, Subdue is an ideal preventative treatment for Pythium blight. Plus in newly seeded or overseeded turf, you get protection from Pythium damping off and blight.

Subdue provides effective control for 10-21 days. Longer residual control than other Pythium fungicides. So Subdue can help you reduce application trips and labor costs. But just as important, Subdue fits your total program because it's compatible with most other fungicides.

Subdue gives you protection like you've never had. Subdue, the only fungicide for Pythium with two-way action.

CIBA–GEIGY

© 1982 Ciba-Geigy Corporation

Circle No. 109 on Reader Inquiry Card

SHIGO AND HIS SAW SHED NEW LIGHT ON TREE HEALTH

By BRUCE F. SHANK

Darkened wood tissue *indicates starch reserves of sample. Slice on left shows virtually no reserves—a hopeless case. Whereas, the slice on right came from a healthy tree with good reserves.*

Alex Shigo, chief scientist at the USDA Northeastern Forestry Experiment Station in New Hampshire, is well-known to the tree care community. In 1950, he began to dissect hundreds of trees with a chain saw to pin down the actual response of trees to injury and maintenance practices. He is largely responsible for finishing work begun by Hepting in the 30's on compartmentalization. Shigo developed a model called CODIT to show exactly how a tree walls off injured and diseased wood to protect the rest of the tree.

His string of discoveries has not stopped. In fact, he is very close to a major discovery within the next two years. If he is correct, a number of standard maintenance practices could be reevaluated or replaced with more effective methods.

I visited Dr. Shigo and his team of scientists in New Hampshire in March to see first hand how he works and what is on his mind for the coming years. Take my word, his lab is a busy one with thousands of wood samples stacked for testing and his staff going in and out for more.

The following article is based on 12 hours of interviewing. Hopefully it describes the unique train of thought of this leading tree researcher. Consider these statements by Shigo, "We should be more concerned with selecting and planting decay-resistant trees than with trying to treat trees like humans. We must have strongly compartmentalizing trees in the city. A tree can survive after many severe wounds as long as it has the energy and time to wall off the injured and infected tissues. Trees may contain a large amount of decayed wood without having obvious external indicators. Tree care practices are based upon a concept of tree decay developed more than a century ago."

Continues on page 30

The City That Works Works With Woods

There's a lot of grass to mow in the Windy City, and Chicago's Park District uses rugged Woods mowers to help them cover a lot of ground.

But Woods mowers aren't designed just for large areas. In fact, we make mowers that cut swaths from 3 1/2 feet all the way up to 20 feet. Plus, we offer more rearmount and undermount models than any other manufacturer of tractor-powered mowers. New tractors or old, domestic or imported, Woods has a mower to fit the tractor and the job.

Send for complete specifications on the dependable line of Woods mowers today.

for 34 years the name to remember for quality and performance

WOODS

Division of Hesston Corporation
Oregon, Illinois 61061

Circle No. 141 on Reader Inquiry Card

Once an idea is firmly established, it takes years of hard work and education to amend it. Shigo has spent more than 30 years reevaluating old notions about three disease and care.

There are many people causing unnecessary damage to trees during pruning by cutting into the collar of the branch. Many still use tree wound paint even though it serves no purpose to the tree. During cavity repair, excessive cleaning may reinjure the tree rather than help it. Injecting materials into the tree may do more harm than good, especially if holes are drilled along the same line year after year. These are just a few of the conclusions made by Shigo while working for the Forest Service.

The biggest breakthrough, however, may be just around the corner. Shigo is focusing on the energy needed for a tree to protect itself and the level of stored energy in healthy versus unhealthy trees. If the energy problem can be solved, then perhaps the tree will depend more on itself for maintenance.

"It really was the chain saw that made it possible to find out so much about trees so rapidly," Shigo says. He estimates he has sliced and cored more than 15,000 trees in his research. It is the chain saw that makes Shigo different from his fellow researchers. He takes the lab work of others and goes to his lab, the forest, for application. "A scientist doesn't create totally new ideas," says Shigo, "He adapts the ideas of previous scientists to a new perspective."

Most of Shigo's concepts are recent. Even though his work extends to the late 40's, his CODIT system, pruning recommendations, and wound dressing findings were published only in the last five years. For science, that is very recent and those who apply his work today are current.

His work on energy reserves in trees really developed out of Dutch Elm Disease research he is doing. When potassium iodide was applied to cores or slices of various trees, healthy trees showed good starch reserves while dying trees showed little if any reserves. The thought follows if starch reserves can be restored, the tree's defensive reactions will improve and it will survive. Shigo is also working on Chestnut blight.

One of his first successes was the detection of weak utility poles by an electrical probe, now known as the Shigometer. The electrical resistance of the pole to a pulsed current can show whether a pole is sound or not. The same technique can be used for trees to detect interior decay. The device was actually constructed for New England Bell and is now produced by an electronics firm. Shigo did not name the device nor does he receive any money from its sale.

Compartmentalization in Trees

The original concept of tree decay was wounds expose heartwood and decay organisms attack the "dead" heartwood. Arborists saw many trees with decayed interiors and this concept made sense. In the 1930's, G.H. Hepting of Mississippi studied tree decay following forest fires. He noticed that decay in trees tended to be localized.

Shigo knew of Hepting's work and used a one-man chain saw, first developed in the late 40's, to dissect trees across and up and down. From his findings, and those of his colleagues, Shigo hypothesized that the tree responded to injury by creating vertical and horizontal barriers to contain the spread of decay. He developed an explanation involving four walls, three stopping inward or vertical spread and a fourth separating the wound from new growth. If you look at a slice of an older tree, you

Continues on page 34

Myths About Trees

1. Trees heal wounds.
2. All wood cells are dead, unresponsive.
3. Decay develops unrestricted through heartwood.
4. Decay starts when wounds expose heartwood.
5. Trees get their food from the soil.
6. When pruning, cut flush with the stem.
7. Frost initiates frost cracks.
8. Callus forms on from the sides of the wound.
9. Point ends when tracing wounds, use pointed or diamond-shaped washers.
10. Core holes to drain water from cavities.
11. Cavities should be cleaned to sound wood.
12. Wound dressings stop decay.
13. Water causes rot.
14. Decay is a problem of old trees only.

Shigo's laboratory *is the forest where he makes unusual cuts with his chain saw to expose new facts on tree response to injury and decay.*

JUST ABOUT EVERYWHERE YOU LOOK, YOU'LL FIND ANOTHER USE FOR ROUNDUP® HERBICIDE.

Tennis Courts

Sandtraps

Cart Paths

Renovations

Signposts

Think of all the places unsightly weeds and brush can plague your golf course. Around greens. In rough. In and around sandtraps. Near the clubhouse and tennis courts. Along cart paths, sidewalks and driveways. Along fencerows. Fortunately, there's one herbicide you can use in *all* these key problem areas—Roundup.®

No other herbicide is as effective or versatile as Roundup for control of tough emerged weeds and brush—wherever they grow. Sprayed on the foliage of actively growing labeled weeds, Roundup herbicide goes right down to the roots and controls the entire plant. So treated weeds won't grow back.

Yet Roundup is inactive in the soil, so it can't wash or leach out of treated areas to injure desirable vegetation.

See your chemical dealer soon for your supply of Roundup. And control golf course weeds effectively—from the first tee to the clubhouse.

FOR A FREE GUIDE TO ROUNDUP, CALL 1-800-621-5800 TOLL FREE. IN ILLINOIS, CALL 1-800-972-5858.

Monsanto

ALWAYS READ AND FOLLOW LABEL DIRECTIONS FOR ROUNDUP.
Roundup® is a registered trademark of Monsanto Company. © Monsanto Company 1982. RUP-SP2-113

Circle No. 125 on Reader Inquiry Card

Daconil 2787.®
It's the
groundwork for
a more
playable
course.

For more and more superintendents that's the case. Because they know effective disease control is the best way to achieve a better looking, more playable course. And that's why Daconil 2787 fungicide is the basis of their fungicide spray program.

Number one on tees and greens.

Daconil 2787 is the product of choice on America's tees and greens.

The reason... Daconil 2787 works. It consistently delivers unsurpassed control of 9 turf diseases including dollar spot (and benomyl-resistant dollar spot), Helminthosporium (leafspot and melting out), red thread and large brown patch.

Fact is, Daconil 2787 is the broadest spectrum contact fungicide on the market today.

What's more, in 15 years of continuous use, there has never been a documented case of resistance. Even on courses where it was applied at weekly intervals for many years.

Outstanding on fairways.

Make Daconil 2787 the groundwork of your program for fairways too. It will deliver the same unequalled disease control it does on tees and greens.

And you need first rate protection on fairways. Because diseases are mobile and can easily spread from fairways to tees and greens. Especially dollar spot, brown patch and leafspot.

You can control these three major diseases on a wide variety of grasses all season long with Daconil 2787 without having to worry about burning fairway turf even in the hottest weather.

Easy and economical to use.

The flowable formulation of Daconil 2787 allows for fast, easy handling because it flows readily and disperses quickly. So there's no clogging of spray equipment.

And since Daconil 2787 has a built-in surfactant, you're assured of superior sticking power, extended coverage on the crown and sheath of grass blades and excellent fungicide retention even after heavy rains or watering.

All of which adds up to proven residual control when used at recommended rates.

When you consider everything Daconil 2787 has to offer, it's no wonder more and more superintendents are making it the basis of their disease control program. On tees, greens, fairways and even ornamentals.

With a full and regular schedule of Daconil 2787, your turf will be healthier and more vigorous to better withstand traffic and play. And it makes for easier weed control too.

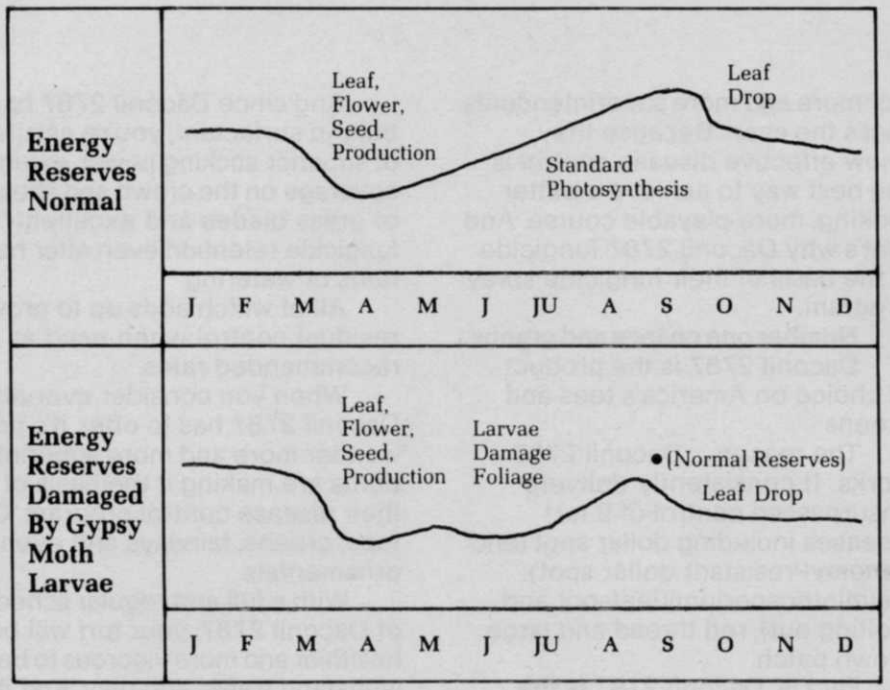
Groundwork like that adds up to a more playable course. And in your business, that's the name of the game.

Diamond Shamrock
Agricultural Chemicals Division
Diamond Shamrock Corporation
1100 Superior Avenue
Cleveland, Ohio 44114

Always follow label directions carefully when using turf chemicals.

Circle No. 113 on Reader Inquiry Card

SHIGO *from page 30*



can see areas where injuries by man or insect caused decay and the tree walled the wound off.

Recently, Shigo has theorized the walling off process takes energy, just as growth, foliage production, and seed production do. If a tree is weak from performing any normal task or from previous wounds, it walls off poorly and decay will spread.

In pruning, cutting flush to the trunk injures the collar of the branch. This, in turn, causes damage within the trunk. If the collar is not damaged, a wall will form and no damage is done to the trunk. This outer wall, according to Shigo, is highly protective but weak structurally. When other strains, such as wind or temperature, are put on the trunk, the tissues along the exterior wall may split to form a circumferential crack called a ring snake.

The so-called heartwood of a tree may not be active in nutrient transport and storage like the sapwood, but it does provide support and will wall off decayed tissue like sapwood. The heartwood, Shigo found, is not defenseless.

Cabling and bracing does cause injury to the tree, but this damage can be minimized. Holes should be made only in sound wood and large, round washers should be used. The tree will surround and grow over the bolt, washer, and nut if properly done. Square or diamond-shaped washers should not be used since the tree has difficulty walling these off.

Lag screws should also be placed into sound wood only to assure healthy walling off of the screw inside the branch or trunk.

Prior to filling cavities in trees, do not cut the wound to be pointed at the top and bottom. The wound will close better if the shape of the opening is oval or round. Filling the cavity is a preferred substitute to drilling a drain tube. Drain tubes only cause more injury. Wet wood does not necessarily mean decayed wood, Shigo says. Filling and draining cavities may not be helpful.

Other Ideas

One major problem with Dutch Elm Disease, according to Shigo, is the tree produces seed before it leafs out. Therefore the tree is not replacing energy by photosynthesis during seeding. The borer attacks the tree in a weakened condition, and the elm lacks the energy to properly wall off the injury. If the elm were healthy and had the needed energy to wall of the insect's damage, it would stand a better chance of survival.

You can make an energy curve for a tree by charting when it uses energy and when it produces energy. It can only produce energy via photosynthesis or draw from it's reserves. Leaves carry on the process of photosynthesis, so deciduous trees produce energy only from spring to fall. Leaf, flower, and seed production use energy. Growth and defensive actions require energy as well. Any energy consuming process that occurs while the tree lacks leaves is a potential drain on its reserves and health.

As Shigo says, the city tree has many more problems than its forest relatives. Competition for survival from the seed stage is greater in the forest, however. Nursery practices may produce trees which wouldn't survive in the forest.

Trees with favorable energy curves, storage capacity, or natural resistance should be selected in the future for urban use.

Finally, some maintenance tools have not kept pace with research findings, Shigo says. Few saws or pruning tools work without damaging the collar or branch ridge during pruning. Too often the cut is sloppily made and bark is stripped during pruning. The size of the saw may actually prevent proper placement outside of the branch collar.

Shigo says there is a point when you let the patient die. Core samples showing little or no starch indicate the tree is a hopeless case. His hope is that trees with declining reserves can restore them in some way.

The case of the Gypsy Moth is a perfect example of dwindling energy production caused by foliage damage. Weakened trees are more susceptible to other injury. If energy reserves could be restored, defoliated oaks could stand a better chance for survival. Elms and chestnut trees which still have hope could be saved in the same way.

The theory appears sound. Shigo and other researchers in the U.S. are working cooperatively to prove it's sound. Some results will be available this fall. I'm going back to New Hampshire this summer to see Shigo and his team for an update. As soon as there is proof, *Weeds Trees & Turf* will let you know. **WTT**

Banvel® 4-S Herbicide gets a powerful new tank-mix label. So you'll get all the extras.

Banvel® 4-S Herbicide has a new label that gives you greater application flexibility. You can now tank-mix Banvel 4-S to add more weeds to your controlled list. And to get all the extras you want in a tough, dependable herbicide.

Extra options for tank-mixing.

You can now use Banvel 4-S Herbicide in a variety of combinations. Tank-mix it with 2, 4-D. Or MCPA. MCPP. Even bromoxynil. More than ever, Banvel 4-S fits your tank-mix preferences.

Extra control in a weed and feed program.

With its new label, Banvel 4-S can be applied using either sprayable liquid fertilizer or water as the carrier.

Extra broadleaf weed control.

The new Banvel 4-S label puts you in control of more weeds, including many of your worst problem broadleaves.

Extra application flexibility.

You're no longer limited to one application per year with Banvel 4-S Herbicide. Used at low rates, Banvel 4-S can be applied in retreatment programs up to two pints per acre during a growing season. Plus, Banvel 4-S can now be used on non-cropland, brush areas, fencerows and roadways, as well as turf and lawns.

Check all the extras you get with Banvel 4-S Herbicide's powerful new tank-mix label. See your lawn or turf chemical supplier today for more information.

*Banvel Herbicide is a registered trademark of Velsicol Chemical Corporation. Before using any pesticide, please read the label.

VELSICOL
CHEMICAL CORPORATION

Velsicol Chemical Corporation,
World Headquarters
341 East Ohio Street, Chicago, Illinois 60611

Circle No. 139 on Reader Inquiry Card

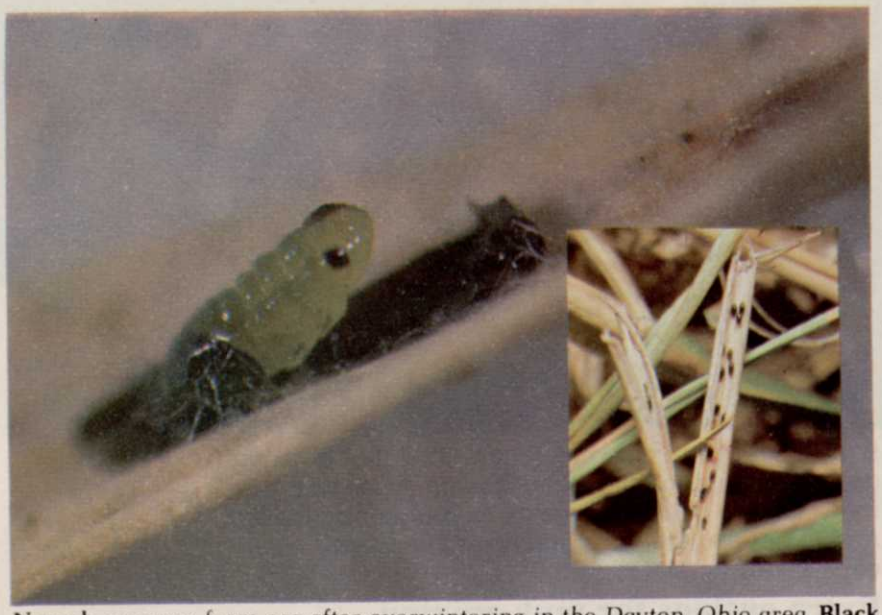
TURF INSECTS

GREENBUG BUILDUP IN OHIO IS LINKED TO OVERWINTERING

By HARRY D. NIEMCZYK and KEVIN T. POWER

The greenbug, *Schizaphis graminum* (Rondani), has been a persistent problem on Kentucky bluegrass and fine fescue lawns in the midwest since the mid 1970's. In 1981 significant damage was reported from Iowa and Minnesota.

In Ohio, damage was minimal through the summer and early months of fall. However, for reasons not yet understood, populations in Cincinnati and Dayton increased dramatically in late October and persisted through most of November. Doug Halterman, Vice President of Leisure Lawn Corporation, Dayton, Ohio, and Dr. Dan Potter, University of Kentucky, both reported a similar buildup in Louisville, Kentucky. Infestations were high enough to cause severe damage to some lawns. In Ohio, swift application of Orthene® by lawn care firms kept damage from being even more extensive.



Nymph emerges *from egg after overwintering in the Dayton, Ohio area.* **Black eggs** *on infested turf were collected in March and hatched after 48 hours at room temperature.*

Many eggs laid in 1981

Examination of the infested Ohio lawns in November revealed thousands of greenbug eggs on grass blades and debris, such as tree leaves. While egg-laying female greenbugs have been collected previously from infested Ohio lawns during October - November (WTT June 1980), eggs were rare.

Laboratory and field observations have shown that greenbug eggs are light green when first laid, but soon turn shiny black. Eggs are glued to the surfaces of grass blades and various other debris commonly found in lawns.

Dr. Harry Niemczyk is professor of entomology at the Ohio Agricultural Research and Development Center in Wooster. He is also a member of the *Weeds Trees & Turf* editorial board. Kevin T. Power is turfgrass entomology technician, OARDC.

Winter survival confirmed

The uppermost question was: would the eggs survive the winter? To shed light on this point, plugs of turfgrass containing overwintered eggs were collected March 2, 1982 from lawns where they were observed the previous November. Some plugs were potted and placed in the greenhouse where temperatures remained about 75°F. Samples of eggs were also removed and incubated in the laboratory.

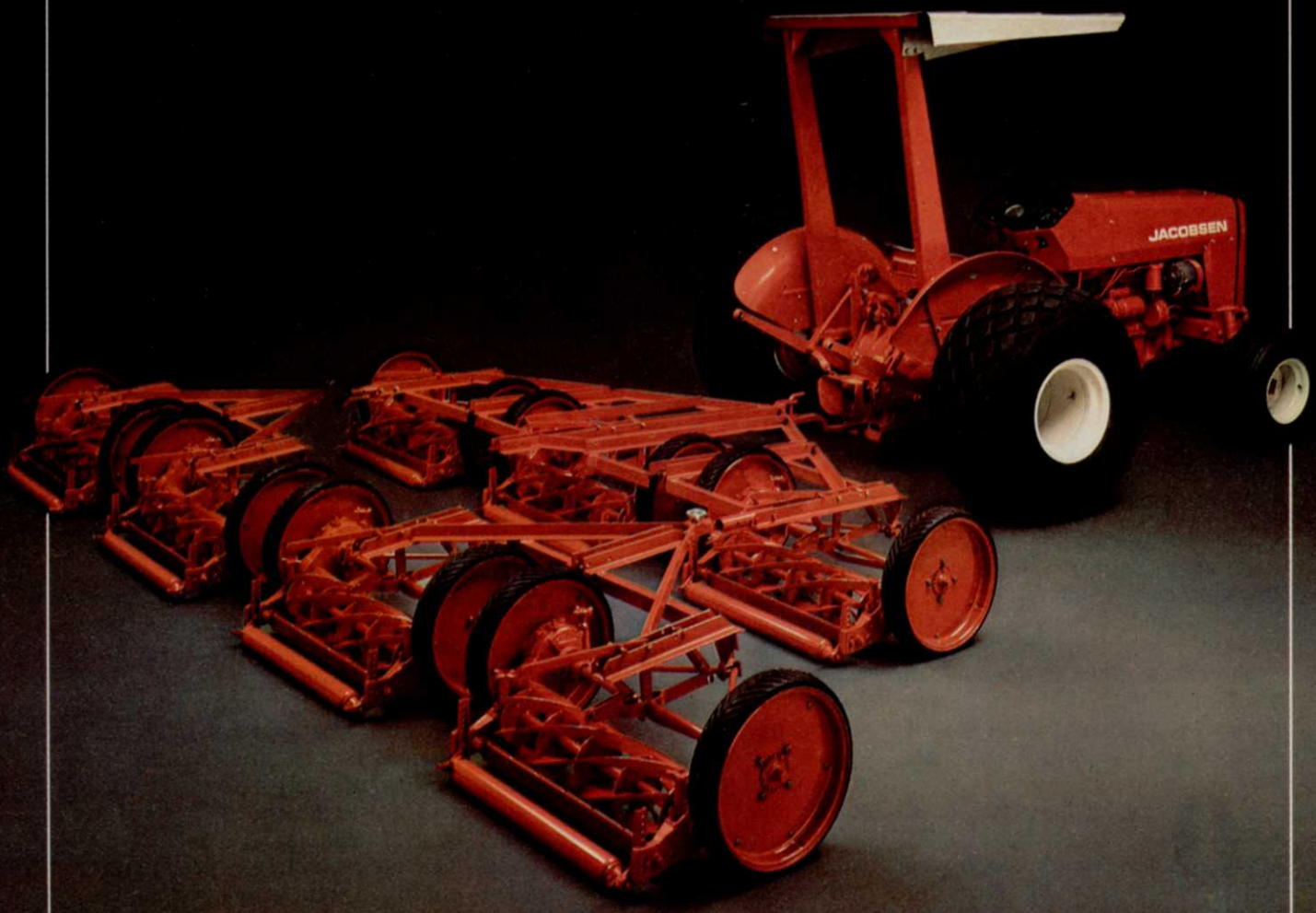
Within two days after being placed in the warm environments, eggs began hatching. In the same trial, pots placed in the greenhouse had 8 to 10 newly hatched greenbugs on the grass blades. This occurrence confirms my earlier theory (WTT June 1980) that the greenbug can overwinter as an egg on home lawns in northern states.

Halterman also reports hatched eggs found March 31, 1982.

What to expect

Does this mean lawns with many overwintered eggs will have a severe problem in 1982? Laboratory observations made on one of the newly hatched greenbugs gives cause for some concern. Seven days after this aphid emerged from the overwintered egg, she bore three healthy young greenbugs. Surely the probability of a problem developing on such a lawn is at least increased. Frequent rains and extreme fluctuations in temperature which commonly occur during spring can destroy many newly hatched aphids. We plan to monitor further the development of greenbug populations on lawns that had high egg populations during the winter of 1981-82. **WTT**

You just can't buy better gang mowers.



It's been proven time and again, day after day, acre after acre. You just can't buy better cutting gang mowers. For a very convincing demonstration, call your Jacobsen Distributor.

JACOBSEN
TEXTRON

Jacobsen Division of Textron Inc.

Circle No. 117 on Reader Inquiry Card

Jacobsen: You just can't buy any better.

CLEMATIS: VINE FOR EFFICIENT LANDSCAPES

By DOUGLAS J. CHAPMAN

Dutchess of Edinburgh *blooms on wood from the previous season.*

Clematis was originally introduced to the Americas by the late Colonel J.E. Springer. Clematis can be a colorful find, depending on the type, from May through October.

Generally, clematis does have a problem if planted in wet, poorly-drained soils but, if planted in well-drained, moist loamy soils, clematis thrives.

Clematis prefer limestone or alkaline soils with a pH from 7 to 7.5, although it has been noted to grow in pH as low as 5. But grow and thrive are two separate conditions.

One should consider planting in conditions from partial (80%) to full sun. To discourage problems, heavy organic mulching is important. This not only keeps the roots cool but also provides additional moisture; not withstanding, clematis is a vine that likes frequent watering or, minimally, high humidity. The most significant disease problems are leaf spot and stem rot which often cause the plant to decline or die out. These problems are only significant when the clematis is planted in poorly-drained-wet soil or in very shady conditions.

The clematis should be grouped into two classes-plants that bloom on previous season's wood (should be pruned after flowering) and plants that bloom on current season's wood (can be pruned during the spring).

Those that bloom on previous season's wood include *Clematis macropetala, C. montana,* and the cultivars 'Duchess of Edinburgh' and 'Nelly Moser.'

The clematis that are probably the most effective and easiest to culture include the ones that bloom on current season's wood, e.g. *C. jacmanii, C. peniculata, C. texensis,* and *C. viticella.* Several of the cultivars include 'The President,' 'Lord Neville,' *jackmanii* 'Superba,' and 'Picadilly.' A detailed look at several of the individual types will help give us an idea about culture and general aggressiveness in the garden.

The native Scarlet Clematis *(C. texensis)* is a vine, reaching 6 feet in height with bright scarlet bell-shaped flowers which one can expect to see blooming from July through the first frost. Its bell-shaped flowers are exciting. This vine is perfectly hardy from Texas to Central Maine. The fruit are typical prune-shaped seeds which can give additional effectiveness during the mid to late fall months.

Sweetautumn Clematis (*C. paniculata* or *C. dioscoreifolia robusta),* an introduction from Japan, is probably the most aggressive and landscape effective of the clematis plants. It is not uncommon for Sweetautumn Clematis to reach 30 ft. in height, blooming in late August on current season's wood. The

Continues on page 42

Douglas J. Chapman is a horticulturist at Dow Gardens, Midland, Michigan

Extra good reasons the grass is greener on the Safe-T-Lawn® side. 16 pages of gifts in the Spec 'N' Get Bonus Selector.

If it isn't enough that Safe-T-Lawn offers more plastic pop-ups, more plastic nozzles and more brass nozzles than anybody else...If it isn't enough that Safe-T-Lawn offers ball-drive rotaries, impact sprinklers, valves and controllers...If it isn't enough that the entire line is stocked in three warehouses for immediate shipment from the West, Southwest and East...Now, there are even more good reasons to buy Safe-T-Lawn irrigation components.

Spec and buy the best, get the best. Starting right now, you get points for every Safe-T-Lawn item you purchase. Those points translate into fine brand merchandise gifts you can use in your home and personal life. Gifts like food processors, clocks, video recorders, radios, china, chain saws, sports equipment and more.

The Spec 'N' Get Bonus Selector shows it all. You can pick bonus after bonus from the 16 color pages in the Bonus Selector. Right up until the last day of October, 1982. There's no limit as long as you keep buying the quality products made by Safe-T-Lawn.

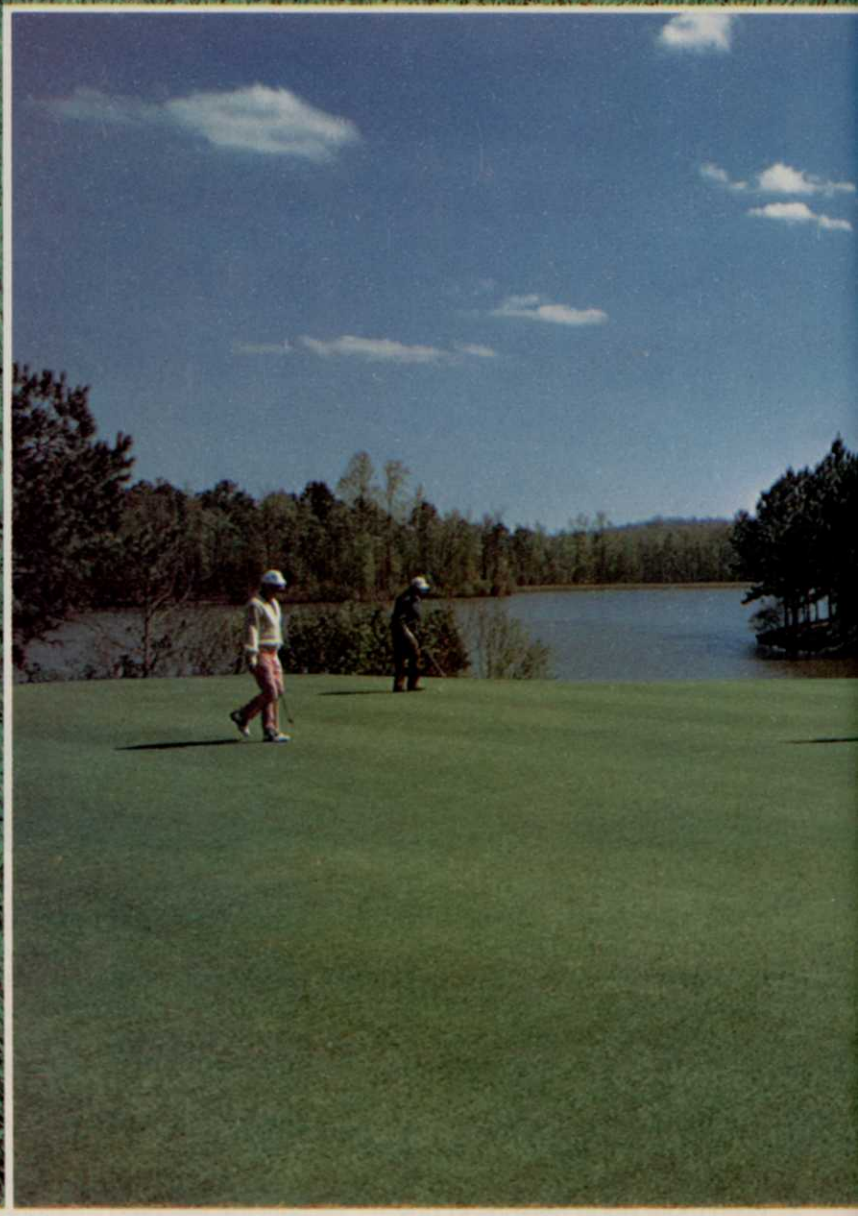
Get your Bonus Selector from your distributor. You can pick up a copy of the Safe-T-Lawn Spec'N' Get Bonus Selector at your distributor. (It contains full details.)
Or have your copy mailed by calling:
Fresno: (209) 291-4571.
Ft. Worth: (817) 457-8000.
Hialeah: (305) 625-7000.

We're out to make the grass even greener on your side of the fence. And this is just the beginning.

Where the grass is always greener.

SAFE-T-LAWN®

Now, ®BAYLETON. The fungicide for those that insist on first class turf.



As turf professionals like you take a hard look at disease control and fungicide performance, a growing number are turning to BAYLETON 25% Wettable Powder fungicide.

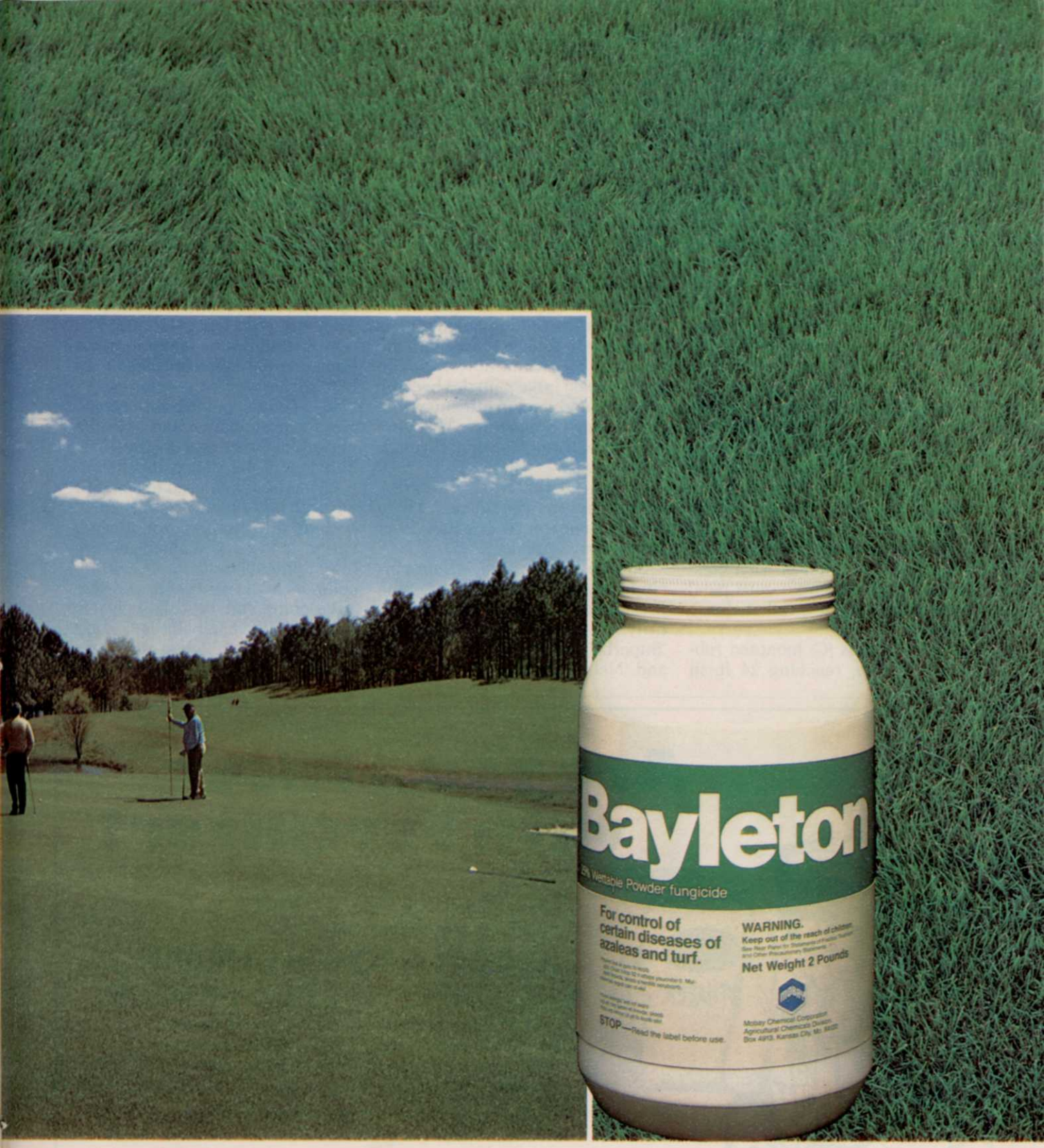
Proven-in-use and highly recommended by university experts, BAYLETON provides turf protection you can believe in.

Unique two-way action both cures and prevents most fungus diseases—gives the turf care professional a valuable weapon to battle costly and unsightly fungus diseases.

Knocks out more diseases: BAYLETON offers the broadest spectrum of disease control of any leading turf fungicide. This includes tough diseases like dollar spot, brown patch, Fusarium blight, red thread, striped smut, certain rusts and pink and gray snowmold.

Cost-efficient: Residual activity of BAYLETON is as much as 14 days longer than other fungicides, so fewer applications are required. Chemical costs can be significantly reduced.

82102 SPG



Fast-acting: Systemic activity provides rapid, uniform protection of the grass plant against disease organisms.

Eases resistance worries: BAYLETON attacks more than one site of fungal activity, so resistance is unlikely. This helps relieve one of your most critical fungicide concerns.

Consider these unique benefits, and you'll see why BAYLETON can bring peace-of-mind to your turf disease control program.

Talk to your turf chemicals supplier today for more information. When you do, chances are you'll become a "BAYLETON BELIEVER."

Circle No. 124 on Reader Inquiry Card

Don't trust your turf to anything less.

Mobay Chemical Corporation
Agricultural Chemicals Division
Specialty Products Group
Box 4913, Kansas City, MO 64120

BAYLETON is a registered TM of the Parent Company of Farbenfabriken Bayer GmbH, Leverkusen.

white 1½- to 2-in. flowers, borne in terminal panicles, are particularly effective, giving a white carpeted feeling to the entire area. In addition to the profuse, fragrant flowers of late summer and early fall, the seeds can be somewhat effective. But this aggressive vine must be kept in check.

Big-Petal Clematis (*C. macropetala*), a hardy native of Northern China through Siberia, is a subdued vine, reaching 10 ft. in height. It flowers during the spring and, therefore, the flowers are borne on previous season's wood. These blue 2- to 4-in. diameter flowers can be particularly interesting—a unique addition in the gardens, growing on yew branches or old pine roots, being effective early in the season. Wyman suggests the flowers are somewhat distinct as the center of each blossom is filled with numerous petal segments, giving it a rather dense texture.

Pink Clematis (*C. montana rubens*) is a vine, reaching 24 ft. in height. The 2- to 2½-in. rosy-red to dull pink flowers initially appear in May and bloom through much of the summer. This native of Central to Western China was introduced by E.H. Wilson. It flowers on previous season's wood but can be a hardy, exciting addition for much of the summer.

Another native, Virgin's Bower (*C. virginiana*), is a tight vine, growing 12 to 20 ft. in height. It has bright green foliage throughout the summer. The white flowers which are borne on large panicles become effective and remain effective from July through September. This vine is native from Georgia through Nova Scotia.

Italian Clematis (*C. viticella*), with its rosy-purple flowers, 1½ to 2-in. in diameter, is effective from June through August.

Some of our favorite varieties include 'Henryi' - clear white, 'The President' - a medium blue, 'Piccadilly' - pale violet, *jackmanii* 'Superba' - a dark, rich red to violet, and 'Nelly Moser' - a pink clematis.

There are several nurseries who have been leaders in the development of clematis. In the U.S., Steffan's Nursery of Fairport, New York, offers many of the species and cultivars of clematis which are hardy throughout the Northeast. In the United Kingdom, the nursery "Treasures of Tenbury," managed by Raymond Evison, is a standout. They not only have the most current techniques as far as propagation and production are concerned, but he has recently completed a visit to China, looking for new species for introduction and hybridizing which may add to the many offerings of this rich, colorful vine.

Clematis, when used in companion with other plants, can be an excellent addition to our already varied landscape without increasing maintenance costs. It can add color in a period when we don't have color and be relatively low maintenance. Clematis is a major group of vines which is almost unknown in the United States. **WTT**

Are you a Miser with Fertilizer?

If you're cutting down on your fertilizer and water bill,

OREGON GROWN CHEWINGS AND CREEPING RED FESCUE

is the grass you need. It's fine bladed and blends very well with other turf grasses. The fine fescues are noted for being real misers when it comes to low maintenance turf areas.

Use Oregon grown fine fescues for overseeding any turf area. It's the Miser grass!

OREGON FINE FESCUE COMMISSION

1349 Capital NE • Salem, Oregon 97303 • 503/363•1022

Circle No. 129 on Reader Inquiry Card

Now ... a solid state controller that's so easy to program but so low in price!

Digital readout

0 to 60 minute timing per station; up to 3 start times

Timing accurate to 1 minute per month; active day light

Automatic or manual operation; individual station man operation

Pump/master valve circuit switch (except IC-4)

Battery back-up provides programming protection in case of power failure

UL listed

IC4 *(indoor mount) operates 4 stations, for about $80**

Precision irrigation control at your fingertips . . . it's yours with this new series of solid state controllers from TORO. So easy to program—or re-program whenever necessarry. So reliable, too. Unlike typical electro-mechanical controllers, these TORO solid state models have no gears, motors or cams which eventually wear out or require adjustments. Using state-of-the-art micro electronics throughout, these new control units provide accurate, trouble-free control for your automatic sprinkler system. And you can have this control for around $80.

STARTING AT AROUND

$80*

*Manufacturers suggested list price; subject to dealer option

For more information, see your TORO distributor, or write:

THE TORO COMPANY,
Irrigation Division
Dept. WT-682, P.O. Box 489,
Riverside, CA 92502

OTHER IC SERIES CONTROLLERS AVAILABLE:

IC4D—*4 stations $99.95**

IC8—*8 stations $179.95**

IC12—*12 stations $219.95**

TORO®

Circle No. 138 on Reader Inquiry Card

20th ANNIVERSARY

Robert Moore *has been president of Aquatrols since 1958. His daughter Demie is responsible for sales and marketing.*

AQUATROLS CORPORATION OF AMERICA BUILDING ON A RECORD OF SUCCESS

For the past 25 years, Robert Moore, the developer of Aqua-GRO non-ionic wetting agent, has manned his Aqua-GRO exhibit at countless turf and horticultural industry trade shows. And he's preached the benefits of wetting agents before more industry meetings than he cares to remember. It has taken a while, but his efforts, on behalf of Aquatrols Corporation of America, are finally paying off.

Moore has been president of Aquatrols, a Pennsauken, New Jersey-based company that manufactures and markets Aqua-GRO, since 1958. Over the years, Moore and a handful of other wetting agent supporters have succeeded in influencing a large number of turf and horticultural professionals

Continues on page 46

The new Ditch Witch 1420:

DON'T SETTLE FOR LESS IN A STEERABLE, WALK-ALONG TRENCHER.

If you're investing in a 14-HP-class steerable walk-along trencher don't compromise. You deserve the best; the Ditch Witch 1420. The only steerable trencher in its class with a diesel option that goes through a 36-inch gate.

The 1420 can dig trench 5 feet deep*. Its hydrostatic ground drive can be fine tuned for slow trenching speeds, or stepped up to 2 MPH for movement around the job site. The digging boom is raised and lowered hydraulically, while the digging chain drive is mechanical for efficient use of power.

The 1420 is easy to operate. All controls are accessible from one location, including a single lever that operates steering, ground drive direction and speed. And since the drive wheels are steered, limited direction control during trenching is possible. There's even an optional boring attachment, and an optional outboard bearing support for extra strength in tough digging conditions.

These are just the highlights. Get the whole story on the 1420 from your Ditch Witch dealer. He'll explain why you can't afford to settle for less than Ditch Witch quality. Or call toll-free for literature: (800) 654-6481. The Charles Machine Works, Inc., P.O. Box 66, Perry, Oklahoma 73077, Phone (405) 336-4402.

*Trench width and depth depends on boom and chain set up.

Ditch Witch.
Don't settle for less!

Ditch Witch®

Circle No. 114 on Reader Inquiry Card

to accept horticultural agents as a viable water management tool and taught them how to use wetting agents effectively. In the process, Moore himself has become a familiar and respected figure in those industries.

New venture launched

The idea for Aqua-GRO was actually conceived by Lawrence Fletcher in the summer of 1953. Fletcher, a Havertown, Pennsylvania, homeowner, was determined to find a way to rid his backyard of a persistant puddle without having to resort to tearing up his yard to install a costly drainage system. He knew a little about surfactants and their effect on water and convinced Anthony Gallaccio, a neighbor and a freelance laboratory technician, to test several surfactants on Havertown's loam soil.

Enter Bob Moore, an acquaintance of Fletcher and a former Mobil researcher. Interested in Fletcher's idea, early in 1954 he tested various cationic, anionic and non-ionic surfactants on soil samples he had obtained from California, Pennsylvania and New Jersey. Moore discovered that while they facilitated water drainage, the cationic and anionic surfactants adversely affected soil stability and were phytotoxic. Moore then turned his attention to several non-ionic surfactants which didn't exhibit the same negative characteristics that the cationic and anionic surfactants did.

He noted that the non-ionic surfactants he tested performed differently on various soil types.

Acting on scientific intuition sharpened by ten years at Mobil, Moore blended together the best performer on each soil type and repeated his tests. He found that the surfactant blend worked as well or better on all of the soil types than any of the individual surfactants he had yet tested. Backyard field tests conducted on zinnias showed that the plants treated with Moore's surfactant withstood drought conditions better than those that were not treated.

By the summer of 1954, the liquid non-ionic wetting agent was perfected, and the team named it Aqua-GRO. Fletcher and Moore, certain that they had developed a product that would make home drainage problems a thing of the past, formed Aquatrols Corporation of America to manufacture and market Aqua-GRO.

It wasn't long before both men realized that the decision to market Aqua-GRO to the homeowner was an ill-fated one. The average homeowner simply wasn't knowledgeable enough to appreciate how Aqua-GRO could benefit him, and the product floundered on the market for nearly two years.

Having failed to make any progress in the consumer market, Aquatrols turned to the greenhouse, nursery and golf course markets. Fletcher and Moore reasoned that the professionals in the plant and turf industries would understand the value of Aqua-GRO and readily accept it.

Aquatrols' big break came in the fall of 1956. T. L. Gustin, then President of Philadelphia Toro, took some Aqua-GRO with him to the Breakers Hotel in Boca Raton, Florida. The hotel's golf course superintendent applied some Aqua-GRO to his course. The very next day, he noted a difference on his greens—there was hardly a trace of the normal early morning dew. The Aqua-GRO treated greens allowed normal play earlier in the day than untreated greens.

Gustin sold a substantial quantity of Aqua-GRO in Florida that winter, and when he returned to Philadelphia, he gave Moore a list of turf industry people who were interested in handling Aqua-GRO, the rudiments of a national distribution network were established.

Wetting Agents Come of Age ... Slowly

By 1958, just as Aqua-GRO began to gain a foothold in the market, and despite the 28 patents that Aquatrols held worldwide, several other companies started marketing wetting agents of their own. Some of these products were effective and some weren't. Disappointed by some products' inability to match their company's claims, many people condemned wetting agents as useless.

Sales of Aqua-GRO up to that time were modest at best, and Fletcher opted to leave the company. Moore, positive that Aqua-GRO had vast potential, continued with Aquatrols.

According to Moore, had he known at the time that nearly twenty years of hard work and personal sacrifice lay ahead before he could claim any degree of success, he too might have thrown in the towel.

Moore and other marketers of wetting agents faced the same huge obstacle: The use of wetting agents for water management in turf and horticultural situations was a new concept in the late 1950's and little basic research by objective and respected industry authorities had yet been published.

Catch 22

"Industry acceptance of wetting agents was slow because we didn't have any basic research to back our claim," Moore explains. "We had a hard time getting people to understand that Aqua-GRO improved soil drainage, not by changing the characteristics of the soil, but by changing the behavior of water."

"Basically, we were in a Catch-22 situation. Aquatrols didn't have the money to sponsor basic research, and without research and researcher recommendations to back our claims, not many people were interested in trying Aqua-GRO. We knew that Aqua-GRO worked and that it would sell if we could only get people to try it."

The situation improved some in the 1960's as researchers in Florida and California conducted some applied research involving the use of wetting agents and reported good results.

Undaunted by the lack of research support, Aquatrols introduced a granular Aqua-GRO formulation in 1968. Using vermiculite as a carrier, granular Aqua-GRO was well-suited for incorporation in notoriously hard-to-wet soiless potting mixtures, which were gaining popularity in the greenhouse industry at the time.

Support of Aqua-GRO for greenhouse use was provided by Cornell

Continues on page 49

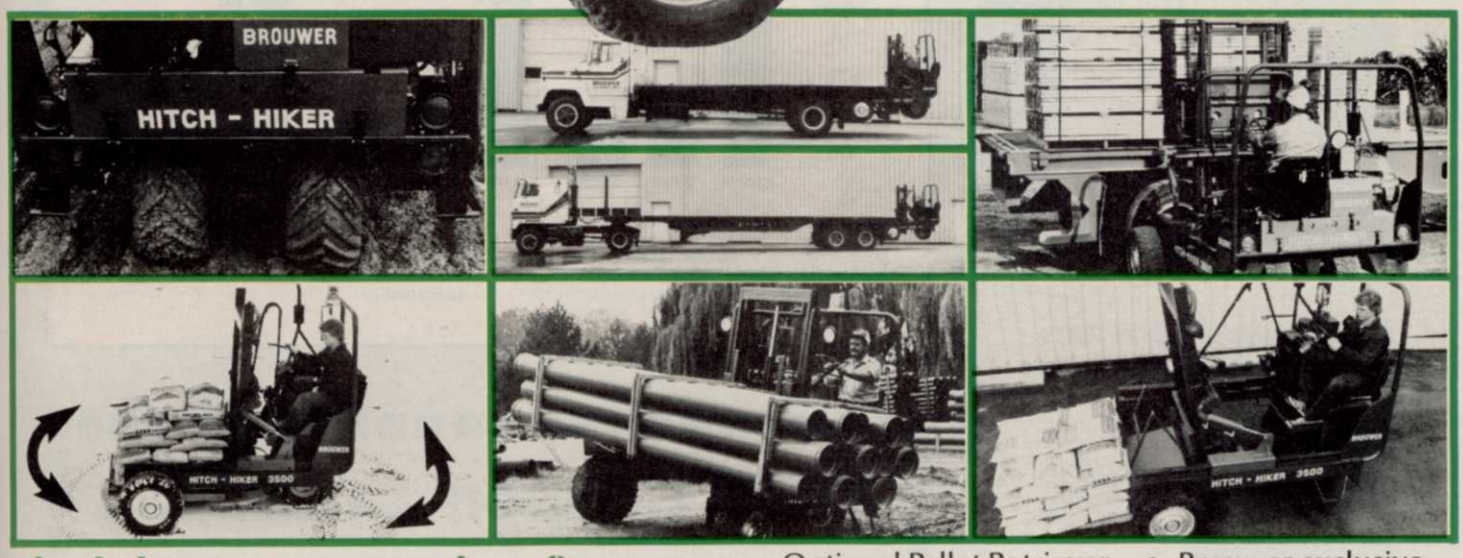
INTRODUCING THE BROUWER HITCH-HIKER

The lightweight, transportable fork lift you can take anywhere, work anywhere, safely, economically.

The Brouwer Hitch-Hiker 3500 lifts 3500 lbs. 93", has an 8" side shift, a 66" turning radius, a 23HP gasoline or 21HP diesel engine and variable speed selection that delivers good fuel economies. The Hitch-Hiker loads, hitches on the transport and goes to work again on the job site.

The big benefit is—

The Hitch-Hiker hustles material as effectively on muddy fields and rough terrain as well as on smooth loading pads. When you have to deliver Hitch-Hiker delivers!



Check these extra proven benefits

Safe, stable, maneuverable Hitch-Hiker's unique engineering gives it necessary clearance for work in the rough without sacrificing its low centre of gravity. Dual 360° rear wheel drive for exceptional maneuverability.

Optional Pallet Retriever—a Brouwer exclusive—retrieves pallets when load is placed—no loss on location jobs. Hooks up quickly to short or long overhangs with high transport clearance, rides easy!

Call us for the dealer nearest you and let us show you how the Hitch-Hiker can deliver for you. Ask us for a proof of performance demonstration.

BROUWER

Brouwer Turf Equipment Limited, Woodbine Ave., Keswick, Ontario, Canada L4P 3E9 Tel: (416) 476-4311

Circle No. 106 on Reader Inquiry Card

Learn how Exhalt® 800 can save you money by preventing fungicide wash-off, blow-off and product "breakdown".

Use the $5.00 Coupon to prove how Exhalt 800 keeps fungicide on trees, shrubs and turf.

We're painfully aware that you may be disenchanted with spreader-stickers, so we want to emphasize that Exhalt 800 is *not* a spreader-sticker. Rather it is a *Sticker-Extender* (we call it a tank-mix encapsulator), and there's a world of difference!

The *spreader* part of a spreader-sticker is a detergent that actually *assists* in wash-off. Exhalt 800, on the other hand, has a unique encapsulating action that causes fungicide to *resist* wash-off.

Simply stated: Spreader-Stickers *assist* wash-off; Exhalt 800, a unique Sticker-Extender, *resists* wash-off.

To get a clear picture of Exhalt 800's superiority, study the chart below. This test, important though it is, is just one of many. Our files hold much other massive evidence of Exhalt 800's unique encapsulating power: the field-test data from many leading universities (test results available on request).

The evidence is clear and overwhelming — Exhalt 800 doesn't cost, it pays. Don't you owe it to yourself to give it a trial now, when you can get $5.00 for doing it?

Percentage of fungicide retained after rains, Exhalt 800 versus Brand X:

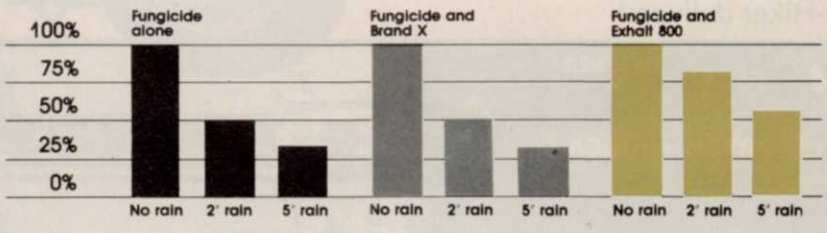
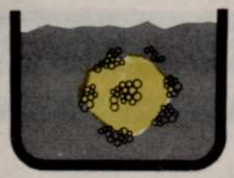


Chart shows how Exhalt 800 resisted wash-off in a laboratory test. Spray coatings were applied to glass panels and dried 10 minutes at approximately 70°F. Retention after erosion by rain was measured by solvent stripping the panels and determining the residual fungicide by quantitative ultraviolet spectroscopy.

A closer look at Exhalt 800's unique encapsulating action.

One miniscule fungicide particle, greatly magnified. Countless millions of such particles in water become the spray solution.

Exhalt 800 enters spray tank. Hydrophobic (repelled by water), it breaks into myriads of tiny droplets and attaches to fungicide.



Tiny Exhalt 800 droplets form a porous "fabric" that encapsulates every fungicide particle, causing it to cling to turf or foliage.

$5.00 Coupon

Send this coupon to PBI/GORDON Corporation.

Attached is an invoice from a Gordon distributor proving that I have purchased a gallon of Exhalt 800 since May 1, 1982. Please send me a check for $5.00. Offer expires October 1, 1982. Limit one per customer.

$5

Name _____

Address _____

City _____ State _____ Zip _____

pbi/gordon corporation

1217 WEST 12TH STREET
P.O. BOX 4090
KANSAS CITY, MISSOURI 64101
816/421-4070

Circle No. 130 on Reader Inquiry Card

Read what users say about Exhalt 800:

Everett Wood is the superintendent of Big Canoe Golf Club in Big Canoe, Georgia. Al Lanoie of PBI/GORDON got him started on Exhalt 800 and now he swears by it. Here are his exact words. "Through the use of Exhalt 800 we are able to spray our greens with pesticide one hour and turn the water on in the next hour with no fear of our pesticide being washed off. This gives us the protection we seek during the heat and stress of the Southeast."

G. Wayne Zoppo is the superintendent at the Agawam Hunt Club in East Providence, R.I. In visiting with Jack Doyle of PBI/GORDON about his experience with Exhalt 800, he said that he has tested it very thoroughly and recommends it to his peers. He says: "Why take chances with expensive fungicides? Use Exhalt 800 with your fungicides for that extra protection. It works, and it is inexpensive."

Only Exhalt 800 Does it all:

- Exhalt 800 holds pesticides in place for longer life.
- Dries in an hour or less.
- Won't wash-off or blow-off.
- Flexes as turf and foliage grow.
- Extends effective control period.
- Saves material and labor expense.
- Economical: use one pint to 100 gallons of spray.
- If frozen, does not separate; can be thawed and used.
- Does not damage turf, trees and ornamentals when used as directed.

GORDON'S
PROFESSIONAL TURF PRODUCTS

AQUATROLS *from page 46*

plant scientists James Boodley and Raymond Sheldrake, developers of soiless potting formulas. Aqua-GRO was one of the wetting agents that they recommended, among the hundreds of wetting agents they had tested, as an ingredient in their soiless potting mixes.

Despite the scarcity of research recommendations, Aquatrols' sales of Aqua-GRO improved slowly but steadily into the early 1970's. Then in 1973, the first turfgrass textbook mentioning wetting agents was published by Dr. James Beard, professor of turf sciences at Michigan State University. Although his book made no positive recommendation of wetting agents, it did recognize them as a turf management tool with useful applications.

Indeed, most of the published research data directly concerned with the use of wetting agents in turf situations has been gathered since 1973—nearly 20 years after the initial formulation of Aqua-GRO.

"Without a doubt, the research conducted by such respected turf authorities as James Beard, Paul Rieke, James Wilkinson and John Madison has provided the basis for the relatively recent general acceptance of wetting agents by the turf industry," Moore contends.

Aquatrols into the 1980's

Responding to the needs of Aqua-GRO users and market opportunities, the company continued to refine its product. Aquatrols added a defoamant to Aqua-GRO in 1976, and introduced a spreadable formulation in 1977.

As Aquatrols' fortunes improved in the mid-1970's, Bob Moore was able to beef up his staff. In 1975, Ed Oberright joined Aquatrols as director of research, and Niki Holroyd came to Aquatrols as office manager. Oberright, who had been manager-in-charge of developing aviation oils and special products, brought 38 years of chemical research experience to Aquatrols. He had been responsible for improving and maintaining the quality of Aqua-GRO.

In the fall of 1977, Bob Moore's daughter, Demie, began working for Aquatrols on a part-time basis. She assumed full-time responsibilities for product sales and marketing early in 1978.

With a goal of further increasing domestic availability and distribution of Aqua-GRO, Aquatrols, in 1980, signed an agreement with Mallinckrodt, Inc. to private label and co-market Aqua-GRO with Mallinckrodt. In 1981, Mallinckrodt introduced Aqua-GRO on the familiar Mallinckrodt green flag. Not content with merely marketing Aqua-GRO in North America, Aquatrols has recently established distribution agreements with companies in Hong Kong, Australia, South Africa and Japan and is presently negotiating agreements with distributors in Mexico, South America and the United Kingdom.

Tip of the iceberg

Demie Moore is optimistic about the future of wetting agents and sees a time when wetting agents will become a standard water management tool in the Green Industry. She draws a parallel between the difficulties encountered by the chemical fertilizer industry in gaining widespread market acceptance and those facing the wetting agent industry.

"It took about 20 years for chemical fertilizers to make substantial progress in the agricultural markets and 35 years before they became generally accepted—wetting agents appear to be following a similar pattern."

Bob Moore agrees with Demie and takes her prediction one step further. "Wetting agents complement all the more efficient management practices being adopted by all sectors of agriculture. Not only do wetting agents make more efficient use of water—a resource that will become scarcer in the future—they are useful in helping to reduce the incidence of water-related plant disease and the volume of pesticides and fertilizers needed to grow plants."

In fact, Bob is convinced that the existing wetting agent market is only the tip of the iceberg, and that in time Aquatrols will discover other useful applications for wetting agents. After 25 years in the industry, Aquatrols has only just begun. **WTT**

VEGETATION MANAGEMENT

By Roger Funk, Ph.D., Davey Tree Expert Co., Kent, Ohio

Q: *Could you tell me if the nematode that kills pines is in our area and if it affects blue spruce? What are the symptoms? (Massachusetts)*
A: The pine wood nematode (*Bursaphelenchus xylophilus*) has now been reported in 34 states including Massachusetts. It has been found in 20 pine species, larch, balsam fir, two species of *Cedrus*, and white and blue spruce. The initial foliage symptoms are lighter green color and droopy needles. Affected trees may die all at once or the lower branches may stay green a little longer.

Q: *I know that pH is a measure of the acidity in the soil, but what do the letters actually stand for? I have not been able to find this in any of my books that discuss pH.*
A: According to Webster's dictionary, the "p" in pH stands for "potential of" and the "H" for "hydrogen."

Q: *Should nitrogen fertilizer be added when organic mulches are used around ornamentals and, if so, how much should be applied? (Colorado)*
A: As organic mulches decompose, some of the soil nitrogen in contact with the mulch is used by the decomposition organisms. Nitrogen deficiency (evidenced by leaf-yellowing (primarily of the lower leaves) may occur, depending upon the nature of the organic matter and the degree of decomposition. If this occurs, nitrogen fertilizer should be added as soon as possible. Two to two and one-half pounds of ammonium nitrate per 1000 sq. ft. or equivalent should be sufficient.

Q: *Do mulching mowers reduce thatch buildup or improve turfgrass quality? (North Carolina)*
A: Mulching mowers are relatively new and, although preliminary research results are favorable, continued research over several years is needed to assess the effect on turf quality.

Kentucky bluegrass plots at the University of Massachusetts mowed with a mulching rotary mower were reported as having significantly higher shoot density, dry weight and quality ratings but no significant differences in thatch depth compared to plots mowed with a conventional rotary mower.

Research at Texas A & M University on irrigated tall fescue indicate that there are few differences in turfgrass color, quality or thatch buildup after one season of observations when compared to turfgrass mowed with a standard rotary mower. However, turfgrass mowed with a mulching mower seemed to remain green longer into the fall and winter.

Q: *In addition to competing for water and nutrients, do grasses produce toxic substances that inhibit the growth of field-grown nursery stock? (Pennsylvania)*
A: Allelopathy is any direct or indirect harmful effect of one plant on another through production and liberation of chemical compounds into the environment. Since it is difficult to distinguish between competition and allelopathy, many researchers use the word "interference" when the causes of growth are not clearly competition or allelopathy.

Research conducted at the University of Rhode Island has shown that leachates from perennial ryegrass, red fescue and Kentucky bluegrass suppressed the growth of flowering dogwood and forsythia. Although this is a clear indication of allelopathy, whether or not other woody plants are affected and to what extent will require further research.

Q: *What are the best means of improving and texturing soil for development of improved grass root systems? (New Jersey)*
A: For good root development and establishment of a lawn, a layer of 4 -6-in. deep top soil having good texture and structure is necessary. Soil texture refers to the size of soil (mineral) particles. Based on texture, soils can be classified as sand, silt and clay. Different home lawns, golf courses, athletic fields and other turf culture may have different soil textures. A soil testing is necessary to determine the condition.

The ideal soil texture for growing turfgrass is a loam, and extremes in soil texture (sands and clays) can be modified with the incorporation of either organic materials or mineral soils.

Organic materials such as peat or manure should be spread in a 2 -4-in. layer and then incorporated into the soil 6 -8-in. deep. Peat humus is the most desirable for soil modification because of its nitrogen content, pH and water absorbing capacity. Composted organic materials also can be used.

Mineral soils such as sand or clay can be used to improve soil texture. For partial modification of a sandy soil, a loam soil high in organic matter and containing 5%-8% clay can be used. For partial modification of a clay, a sand and organic matter is mixed into the upper 10 - 14-in. of root zone.

NOTE: Concerning control for the honeysuckle aphid which was discussed in the January 1982 "Vegetation Management" column, recent information from the University of Illinois indicates that nonsystemic insecticides such as malathion and sevin may not be effective. In addition, dormant oil applications appear to be of little value.

Applications of orthene or cygon when symptoms of infestation first appear have given the best results. Pruning and sanitation are also beneficial.

Send your questions or comments to: Vegetation Management c/o WEEDS TREES & TURF, 757 Third Avenue, New York, NY 10017. Leave at least two months for Roger Funk's response in this column.

THESE INSECTS HAVE ONE THING IN COMMON

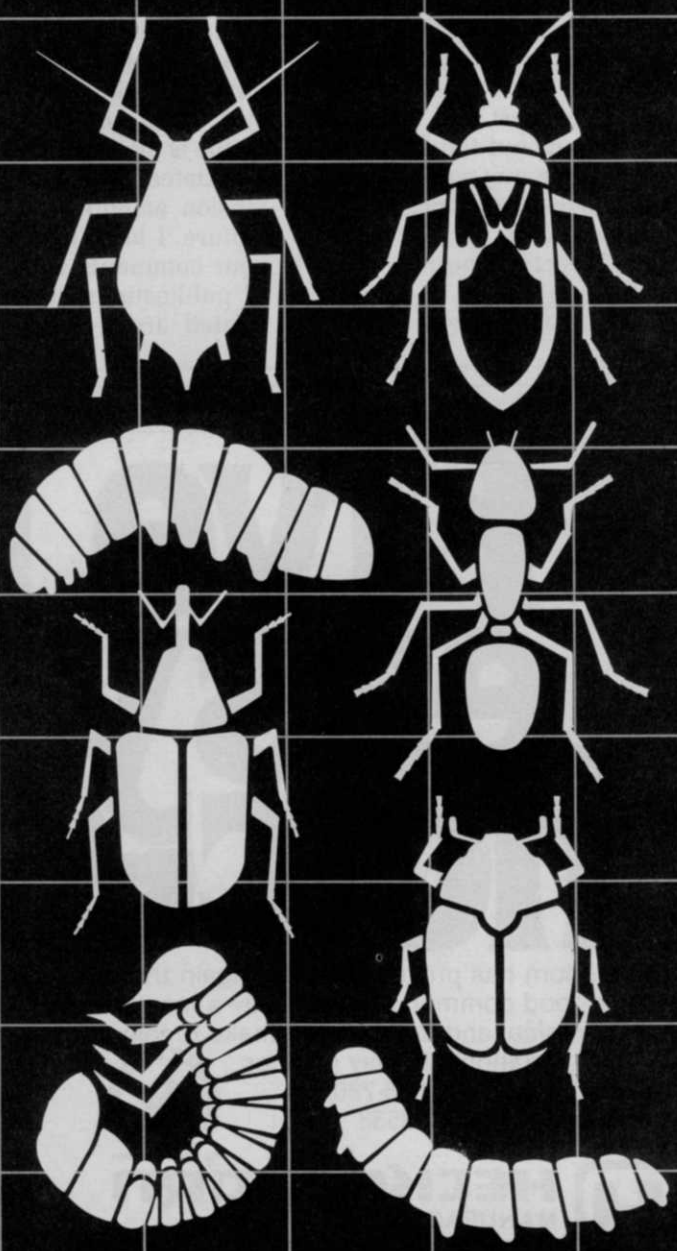
They now can be controlled by a NEW effective carbamate insecticide *TURCAM*®

TURCAM Insecticide offers the professional turf and ornamental care specialists a new effective broad spectrum insecticide for the control of a wide range of ornamental and turf pests including gypsy moth, Eastern tent caterpillar, certain scale insects and weevils, Japanese beetles, sod webworms, chinch bugs, mole crickets, white grubs and various nuisance pests such as fleas, wasps and fireants.

In addition to controlling these and many other pests, TURCAM

- Will not damage your ornamentals
- Will not get tied up in your turf thatch
- Is odorless
- Is suitable for use in Liquid Systems.

For further information on TURCAM including full labeling and recommendations for use please contact your local distributor or write to the address below.



TURCAM®

Broad Spectrum Insecticide

TM

BFC Chemicals, Inc.
4311 Lancaster Pike
Wilmington, DE 19805

Circle No. 105 on Reader Inquiry Card

LETTERS

Al says thanks

To say the very least, I was proud and pleased to become the recipient of Weeds Trees & Turf's first annual Man of the Year Award. It is a signal honor indeed . . . one totally unexpected . . . but one that I will treasure forever.

The beautiful silver trophy, inscribed to commemorate the occasion, will hold a prominent place of display in our home.

My sincere thanks to you and to all responsible for casting their votes for me.

Always the best and continued success throughout the future. If I can help you in any way, please do not hesitate to contact me.

Alexander Radko
National Director Emeritus
Green Section
United States Golf Association

Al:

The pleasure truly is ours. We sincerely saw you as the proper recipient and hope you sense the appreciation we tried to communicate by the award. On the other hand, we have no intention of letting you retire for real. You are a natural resource too valuable to retire. Edit.

Readers heed the call

I hope the readers of your magazine will take heed to your "Outlook" editorial of the April, 1982 issue. What you so accurately describe is the dilemma of leadership associated with research and extension activities throughout agriculture. I hope that you will share your comments with other editors of publications in agriculture and related areas. Hopefully, they in turn will contact their constituents.

Charles Laughlin
Department Head
Plant Pathology and Weed Science
Mississippi State University
Mississippi State, Miss 39762

Dr. Laughlin:

That is a lot of hoping. I'm not exactly Jerry Lewis, but the cause is closer to us than any other at this time. If research dollars dry up, progress will slow markedly. The question is, in terms of Reaganomics, will private industry pick up the slack? Consider the cost of chemical development and retooling changes for equipment, and I think the answer is doubtful.

The only real hope is for readers to get out stationary and write their state representatives today. And then write them a month from now, and again and again until the point is made. Edit.

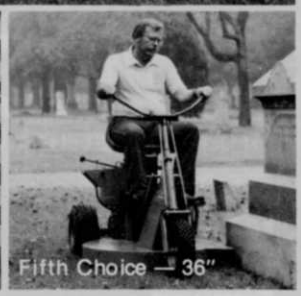
Five easy choices!

First Choice — 88"

Second Choice — 72"

Third Choice — 62"

Fourth Choice — 50"


Fifth Choice — 36"

Heckendorn has proven time and again that it makes good common sense to buy a mower that is economical and durable. We make it easy for you in 5 variations. 5 easy choices.
Call Toll Free 1-800-835-7805 or
in Kansas, 1-800-362-3538

DURABLE BY DESIGN
HECKENDORN

HECKENDORN
MANUFACTURING CO., INC.
CEDAR POINT, KANSAS 66843 / 316-274-4201

Circle No. 118 on Reader Inquiry Card

This magazine gives you good reading, good writing and good arithmetic.

We present the information in our articles clearly, accurately and objectively. That's good writing. Which means good reading.

We present the information in our circulation statement clearly, accurately and objectively. That's good arithmetic.

BPA (Business Publications Audit of Circulation, Inc.) helps us provide precise and reliable information to both advertisers and readers.

An independent, not-for-profit organization, BPA audits our circulation list once a year to make sure it's correct and up to date. The audit verifies your name, your company, your industry and your job title.

This information enables our advertisers to determine if they are reaching the right people in the right place with the right message.

The audit also benefits you. Because the more a publication and its advertisers know about you, the better they can provide you with articles and advertisements that meet your information needs.

BPA. For readers it stands for meaningful information. For advertisers it stands for meaningful readers. Business Publications Audit of Circulation, Inc.
360 Park Ave. So., New York, NY 10010.

BPA

We make sure you get what you pay for.

PRODUCTS

Jacobsen is offering a new hydraulically-driven vertical reel mower that interchanges with standard hydraulic fairway reel units. The mower cuts turf vertically to remove and control thatch

with vertical blade rotation opposite that of standard reels. More information on the mower is available in new literature available from the Jacobsen division of Textron.

Circle No. 145 on Reader Inquiry Card

Clearman has added a wobbling turbine head to its line of lawn and garden

sprinklers made of black sun-resistant nylon with only one moving part. The 5F series offers a maximum coverage of 44-ft. in diameter and droplet size can be controlled, resulting in flow rates from 0.5 gpm to 5.0 gpm.

Circle No. 146 on Reader Inquiry Card

Deer-Away has formulated a deer repellent in powder form. BGR Powder can be applied in dew and light rain because of a hygroscopic agent that absorbs the water and sticks tightly to the vegetation. Deer Away Powder is registered with the EPA for repelling mule deer, white tailed deer, and Roosevelt elk. It comes packaged in 8 and 16-oz. shaker containers and five lb. bulk packages.

Circle No. 147 on Reader Inquiry Card

Geerpres is introducing a new line of professional sprayers made of high density polyethylene, galvanized or

Continues on page 56

TeeJet

NEW SPRAY NOZZLES and ACCESSORIES From SPRAYING SYSTEMS CO.

NEW— *QuickJet*™ Nozzle Assemblies
A unique new system of quickly interchangeable self-aligning spray nozzles and spray tips. To provide choice of spray droplet size, in full cone, hollow cone and flat spray patterns. ¾" NPT (M) inlet conn. Write for Bulletin 195.

NEW— Model 146 *DirectoValve*®
For remote "on-off" control of spray nozzles and booms from operator's location. Operates on 12 VDC system. Pressure range from 0 to 65 psi. 1¼" NPT (F) spray line connection. Write for Data Sheet 16108.

NEW— Model 244 Electrical Regulating Valve
For remote pressure control in agricultural spray applications. ¾" NPT (F) inlet and outlet conn. Operates on a 12 VDC system. Pressures to 100 psi. Write for Data Sheet 16994.

NEW— ¾" and 1" Nylon Liquid Strainers
Strainer head and bowl made of reinforced Nylon material for pressures to 75 psi. Threaded bowl can be easily unscrewed by hand. Write for Data Sheet 15353.

SPRAYING SYSTEMS CO.
North Ave. at Schmale Rd., Wheaton, IL 60187
Telephone: 312 665-5000 / Telex No. 72-8409

Circle No. 136 on Reader Inquiry Card

Clean Up Lakes, Ponds, River Fronts.

New Aquatic Weed Harvester removes both floating and submerged weeds to restore natural ecological balance and preserve fish habitat. Two independently controlled paddle wheels resist clogging even in heavy golf pond weed beds . . . unsurpassed maneuverability even around marina docks. Floats in inches of water, permitting cutting close to shore. Rotating vertical side feeders direct weeds into automatic conveyor to keep cuttings from floating away. Easily trailered from pond to pond without damaging turf. Backed by Mud Cat's international reputation for reliability and ease of operation.

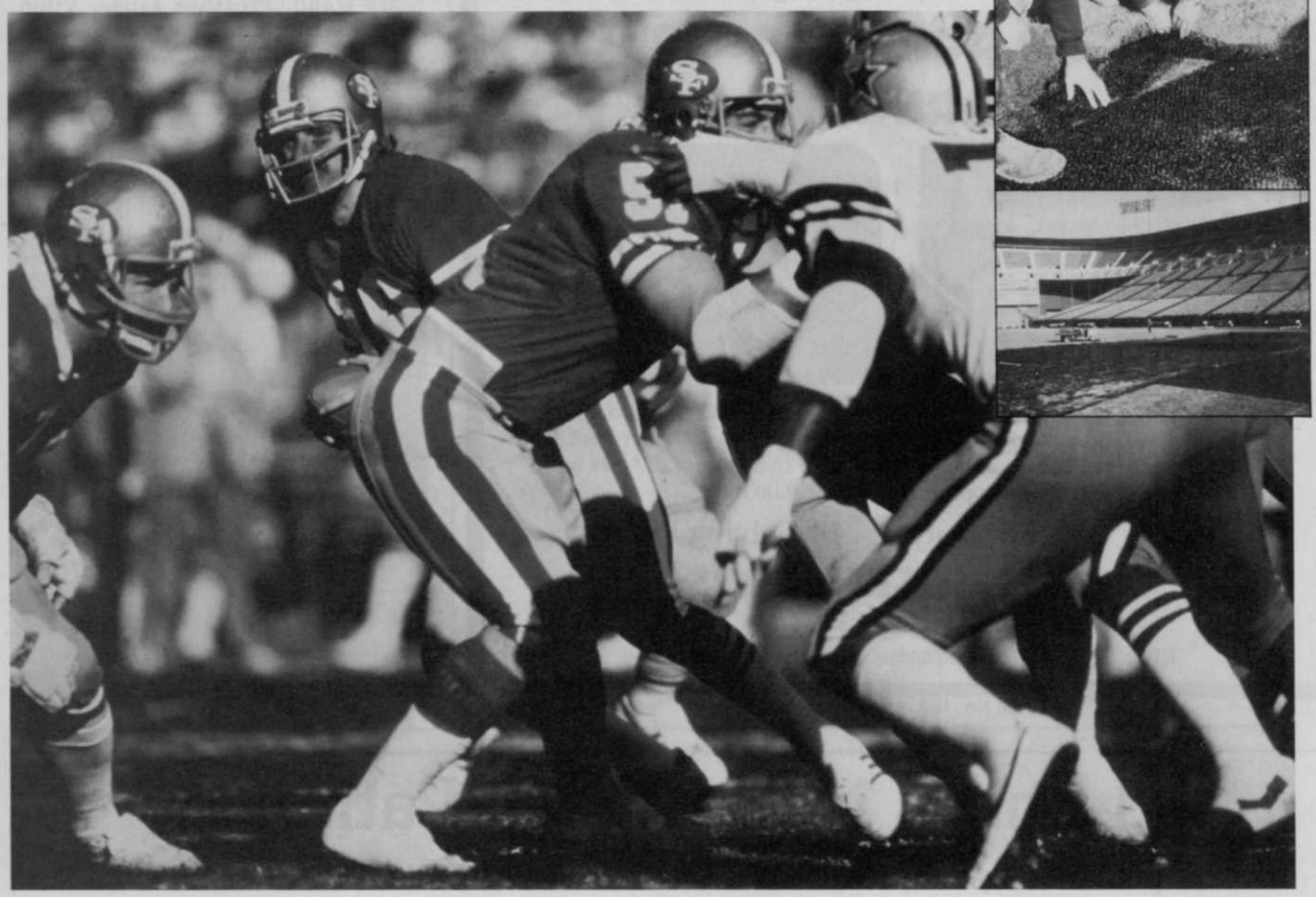
MUD CAT
NATIONAL CAR RENTAL

P.O. BOX 16247, ST. LOUIS PARK, MINN. 55416 U.S.A.
IN U.S. CALL TOLL FREE 800-328-7333
INTERNATIONALLY, OR FROM MINNESOTA PHONE 612/893-6400
TELEX 29-0767

A Division of National Car Rental System, Inc.

Circle No. 126 on Reader Inquiry Card

For the 1981 NFC Playoff, the Enkaturf® system made a superbowl of Candlestick Park.



ENKATURF AND ENKAMAT ARE REG. TMs OF AMERICAN ENKA CO., ENKA, NC, A PART OF Akzona INC., AND ARE THE SUBJECT OF A NUMBER OF U.S. PATENTS.

Candlestick Park wasn't exactly in good condition before the NFC Playoff. **Football** teams seemed to tackle the San Francisco Forty-Niners' turf more than they did the Forty-Niners. And vice versa.

That was before 14,600 square feet of Enkamat® webbing was installed under two inch sod between the field's hash marks, thus forming one more Enkaturf system success.

After installing the Enkaturf system, Candlestick Park was subjected to heavy rainfalls until just prior to the first playoff game. The Enkaturf system performed exceptionally well in spite of the difficult conditions.

The Enkaturf system gives turfgrass the protection it needs to grow and heal itself. The webbing is structured to keep turf anchored and resilient even in heavy traffic areas. Compaction, aeration, maintenance costs and players' injuries are reduced tremendously.

Europe has been using Enkamat on its playing fields for approximately 15 years, concentrating on **soccer fields.**

Eleven of the recently-rated top 40 **golf courses** in the country have made use of the Enkaturf system where soil erosion or excess wear had been a problem. One golf club put 10,000 square feet of Enkamat on their driving range. Other golf courses have used the Enkaturf system for heavywear areas, entrance ways to cart paths, pond stabilization and for the construction of flood plains through golf course facilities where natural vegetation is far more desirable aesthetically than using concrete or riprap.

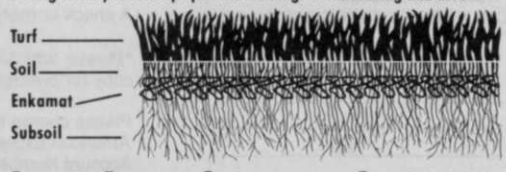
Even more and more airfield ground engineers are considering the reliability of Enkamat in **airstrips.** The Wellington Aero Club in West Palm Beach, Fla., reinforced their 4000-foot grass runways with Enkamat. The stabilizing Enkaturf system provides a smooth, shock-absorbing surface. A smooth landing.

Enkamat is a three dimensional resilient webbing resistant to decay, which provides a permanent fibrous matting that gives the sod structural strength. This can *not* be achieved by any other existing medium, natural or man-made.

Enkaturf reinforcement system stabilizes turf.

Roots can spread and grow in subsoil making the turf more durable.

Strong root system helps prevent damage from tearing and divots.



The Enkaturf System by ENKA

The Enkaturf system is used in **baseball fields, track fields, tennis courts, playground camping sites** especially near mobile homes, you name it.

Enkamat is durable. It's safe from humic acid and soil fungi. You can't lose.

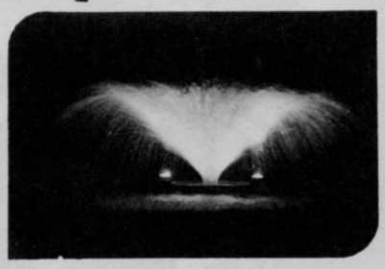
Candlestick Park didn't lose: The Enkaturf system made it a winner.

The ball is in your field now.

Contact: Enkaturf Dept., at American Enka Co., Enka, NC 28728. (704) 667-7713.

OTTERBINE

Spray Sculpture Floating Fountains. Now you can clean up ponds and lakes naturally.



By day or night, these floating fountains help keep your water clean and odor-free naturally, and create a sparkling spray display that enhances the beauty of any surrounding. They are available in a variety of sizes and spray pattern designs, with optional Fountain-Glo lights.

Otterbine Creates Beauty . . . By Solving Problems

OTTERBINE AERATORS

BAREBO, INC.

RD 1, P.O. Box 217, Emmaus, PA 18049 215-965-6018

Circle No. 103 on Reader Inquiry Card

PRODUCTS *from page 54*

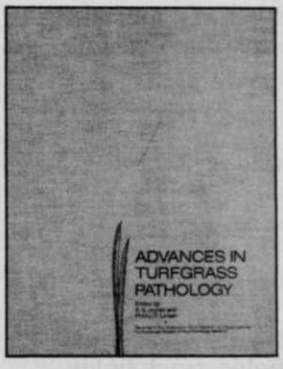
stainless steel. Available in 1-1/2 and 3 gallon sizes, they deliver up to 60 pounds of pressure. Standard features are a pump with rod, and a 12- or 16-in. brass wand. Pressure gauge, Viton seals, 58-in. hose and nozzles are optional.

Circle No. 148 on Reader Inquiry Card

BASF's Agricultural Research Station has found that insulating glass greenhouse walls with an ethyl-vinyl-acetate coplymer incorporating a pattern of bubbles that provides air space be-

Advances in Turfgrass Pathology

published by HARCOURT BRACE JOVANOVICH PUBLICATIONS in cooperation with Dr. B. G. Joyner, Dr. P. O. Larsen and Chemlawn Corporation



This extensive volume contains chapters on:

- turfgrass diseases
- cool v.s. warm season pythium blight and other related pythium problems
- snow molds of turfgrasses
- fairy rings
- leaf spot of Kentucky Bluegrass in Minnesota
- initial and filed fungicide screening
- turfgrass disease resistance
- PLUS MUCH MORE!

$27.95* (hardcover)
$18.95* (paperback)

COPIES LIMITED — DON'T DELAY!

ADVANCES IN TURFGRASS PATHOLOGY is a compilation of more than 23 reports and discussions by the nation's leading turfgrass pathologists. Explore the diseases that attack turfgrass. Find out how to conquer the battle of turfgrass diseases.

KEEP CURRENT WITH NEW IDEAS ON HOW TO HANDLE TURFGRASS PROBLEMS WITH ADVANCES IN TURFGRASS PATHOLOGY.

Return this coupon to: Book Sales
Harcourt Brace Jovanovich Publications
One East First Street, Duluth, MN 55802

YES! Please send me _____ copy(ies) of ADVANCES IN TURFGRASS PATHOLOGY.

Name _____
Address _____
City _____ State _____ Zip _____
Phone _____

$27.95* hardcover $18.95* paperback
Quantity rates available on request.

A check or money order for _____ is enclosed.

*Please add $3.00 per order plus $1.00 per additional copy for postage and handling.

Please charge to my Visa, Master Card, or American Express (circle one)
Account Number _____
Expiration Date _____
Please allow 6-8 weeks for delivery. WTT 62

tween glass, offers about 20% more insulation than conventional film. The sculptured film is made in double and triple deck versions and can be installed with tacks or adhesive.
Circle No. 149 on Reader Inquiry Card

Kubota has introduced a 29-hp tractor equipped with a hydraulic shuttle shifting tranmission. The L355 SS is powered by a four cylinder water-

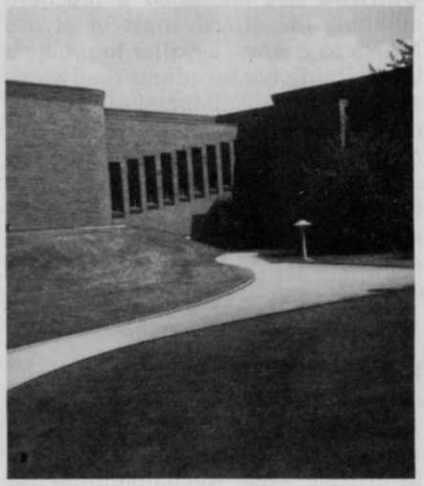
cooled diesel engine with a transmission providing eight forward speeds and eight backward. Standard features include wet disc brakes, safety starting switch, hydraulic pump, swing drawbar, foot rests, fender handrail and hazard lamps.
Circle No. 150 on Reader Inquiry Card

Vandermolen has developed a heavy-duty model Diadem Brush

Chipper powered by a 18-hp twin cylinder engine. It offers a rotor design with ½-in. thick cutting knives that can handle limbs of up to 2-in. in diameter. The unit is compact enough to be moved by one man when detached from the towing vehicle.
Circle No. 151 on Reader Inquiry Card

Flora and Fauna has designed the Treetite bracing kit. According to the company, the brace fosters good root growth without wire or ropes that can cut or slip off the bark. Treetite comes with an expandable strap-tie, that expands as the tree grows, cord and stakes.
Circle No. 152 on Reader Inquiry Card

Ryerson offers steel landscape edging for long straight lines or plastic Ezy-Lok edging for free form design. The steel can be used as a retaining wall for driveways, walks, terraces and for line



Continues on page 58

You can't kill a weed by watering it!

Sometimes applying a herbicide only means watering the very thing you're trying to kill. Now Micron Corp. has solved the problem with the **HERBI** Controlled Droplet Application sprayer.

The **HERBI** is a revolutionary approach to the application of herbicides. It provides better, cheaper, easier weed control along fences, roadways, ditches, around buildings and structures. The secret is its rotary atomizer—a spinning disc which produces consistent 250 micron-sized droplets, for ultra low volume spraying, eliminating the need for high volumes of water. It gives exact and thorough coverage without run off, chemical waste, or over-kill.

The **HERBI** is lightweight—about 7 pounds. It's also extremely versatile, easy to use and, most of all, economical. It's time to stop watering weeds and start killing them . . . with the **HERBI.**

HERBI™

MICRON CORPORATION

P.O. Box 19698/Houston, Texas 77224
(713) 932-1405/Telex 79 2511 MICRONW HOU

Circle No. 123 on Reader Inquiry Card

definition around building perimeters. Available in 16 to 20-ft. lengths, it comes in several widths. According to the manufacturer, Ezy-Lok plastic edging resists weathering and soil acids and contains chemical inhibitors that prevent deterioration from ultra violet rays. It comes in 25-ft. lengths that can be locked together.

Circle No. 153 on Reader Inquiry Card

Conwed has published a brochure outlining the effectiveness of Hydro Mulch as a straw tackifier to promote turf establishment along roadways, strip mines, and building sites. The brochure cites independent studies that compare the product's performance to asphalt and the leading non-asphalt tackifier. Loading and application instructions are also featured in the pamphlet.

Circle No. 154 on Reader Inquiry Card

Framar Industrial has introduced a non-selective liquid weed killer to eliminate vegetation around fence lines, parking lots, railroad sitings and industrial sites. Recommended for non-cropland areas, the herbicide

should control a wide range of perennial and annual weeds. With the purchase of 20 gallons of the product, Framar is offering a free three gallon plastic tank sprayer.

Circle No. 155 on Reader Inquiry Card

Southern Hydro Mulch Supply is marketing a new soil moisturizer, Aqua Lox, for nursery, landscape, and seeding use. The product swells to many times its weight when watered, to open air passages and maintain the moisture level. It can be used to protect plants in shipping and to aid in seed germination.

Circle No. 156 on Reader Inquiry Card

Allis-Chalmers has put out a bulletin describing its CD-5 chain drive tiller and the RT-5 rear tine tiller. Built for heavy duty work, the CD-5 has a sealed chain drive which runs in oil and is

fully protected from dirt and dust. The RT-5 has heavy tines to shred and mix stalks, mulch and green manure crops into the soil.

Circle No. 157 on Reader Inquiry Card

Continues on page 61

CHIPMUNK™ BRUSH CHIPPER

DEPENDABLE ECONOMICAL

IT'S COMPLETE - READY FOR ACTION

Features found only on more expensive chippers are standard on the Chipmunk Brush Chipper. Rugged, all-welded trailer frame takes to any road or terrain. Efficient, gas-fueled, four-cylinder engine delivers all the power you need. Machined steel flywheel guarantees the maximum in chipping power. Exclusive triangular operator guide makes brush loading easier. Exhaust chute has a high-volume air blower to keep chips moving. Replaceable, super-hard, chrome-alloy chipping blades. Chip deflectors for discharging chips into truck or to roadside. Single, locking battery/tool box. Reflectors, running lights. Adjustable tow bar, safety chains and folding jack.

"Depend on Chipmunk"

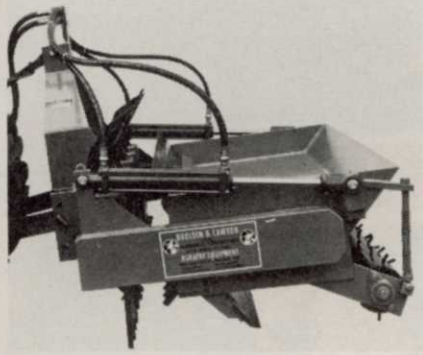
Call or write for literature.

Manufactured by the pioneer of brush chipping . . . with a nationwide service organization you can rely on.

Chipmunk Brush Chipper
50 E. Hamilton St., P.O. Box 901
Chalfont, PA 18914 Telephone (215) 822-0542

Circle No. 102 on Reader Inquiry Card

Bouldin and Lawson's Ground Hogger is a multi-purpose landscape machine. According to the manufacturer, the machine performs many tasks: a clam-shell-type pickup moves railroad ties, poles and rocks; rippers



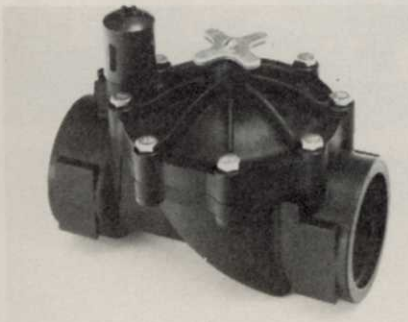
loosen up hard and compacted soil; a dirt mover self loads up to ½ yards of soil; curved blades level forward and backfill; and pulverizer and roller with two rows of spike teeth break up clods and level.

Circle No. 158 on Reader Inquiry Card

Rain Bird has offered the Model 1804 pop-up sprinkler with a four-inch height for unobstructed spray. A patented wiper seal cleans the stem as it retracts, keeping debris out of the unit. Extra-strength stainless steel retractor springs assure retraction even in sandy soils. Additional features include a filter screen under the nozzle and a fully open ½-in. threaded inlet to facilitate case flushing and speedier installations.

Circle No. 159 on Reader Inquiry Card

Weather-Matic is introducing a two-inch plastic control valve for Weather-Matic sprinkler systems with higher flow demand. The valve body and cover are made of durable glass-filled



nylon with stainless steel cover bolts with mating brass body inserts. It also features the Weather-Matic porting valve design that provides a constant flexing action to inhibit debris from blocking the valve function.

Circle No. 160 on Reader Inquiry Card

The HUSTLER SOLUTION to Operator Efficiency.

Simple, twin-lever steering on every HUSTLER model puts forward, reverse, turning, speed and braking control in the palm of one hand.

Equipment operators all have one goal in common — to maximize operator efficiency.

When fatigue sets in, production goes down. The EXCEL HUSTLER eliminates extra, laborsome movements required when mowing around obstacles. There's no steering wheel to fight, no foot pedals to operate. The HUSTLER operator can do with one hand what it takes two hands and two feet to do with competitive equipment.

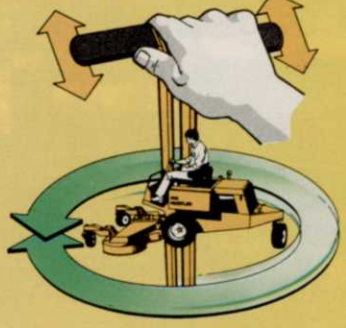
Simple, twin-lever controls put immediate response of forward, reverse, turning, braking and ground speed in the palm of one hand!

Because steering is directed through the drive wheels, a HUSTLER can negotiate true 0° radius turns. How does that increase efficiency?

A HUSTLER can cut square corners without dead-heading over previously-mowed turf and without leaving uncut corner patches. The HUSTLER, with its infinite maneuverability, eliminates the need for trim-mowing and the extra labor/equipment it requires.

The solution to total operating efficiency is a HUSTLER that simply outperforms, outproduces and outmaneuvers any steering wheel mower.

Call Toll Free 1-800-835-3260 or write for FREE literature. And ask about our full line of year-round attachments.
EXCEL INDUSTRIES, INC., Box 727, Hesston, KS 67062



HUSTLER delivers infinite maneuverability within its own radius, with total control in the palm of one hand. EXI-9-382

The choice of the Pros.
EXCEL HUSTLER Turf & Grounds Equipment
Call toll free 1-800-835-3260

Circle No. 116 on Reader Inquiry Card

CUSHMAN® FRONT

SIX GOOD REASONS TO MAKE IT YOUR FIRST CHOICE.

1 Plenty of power, plus economy.

Choose either the 18-hp OMC® air-cooled engine or the 4-cycle water-cooled diesel. Both deliver the power and performance you need. The Front Line mower is designed from the engine up, not from the tractor down, so every working component complements the power plant.

2 Fast, maneuverable, simple operation.

Hydrostatic drive and wheel-type steering make operation easy. Single rear turning wheel, and split front-wheel traction-assist pedals allow smooth, zero-turning radius; the driver's hands stay on the wheel. Mechanical clutch direct-drive PTO gives you a powerful tractor that's built to take it.

3 The cleanest of cuts.

The three heat-treated blades with air-lifts along with the Cushman deck and baffle design cut the grass cleanly. Clippings are lifted up and discharged out the chute evenly, eliminating the blade drag that eats up power. Choose a 60″ or 72″ deck; both offer top-mounted grease fittings and covers that remove with just two wing nuts. The 72″ deck also comes with wash-out holes so collected debris can be flushed out during normal maintenance.

4 No scalping.

Rear deck rollers work along with the front wheels to keep the deck and blades off the ground, even over rough terrain. Springs are also available to absorb deck weight and allow the deck to "float" with the contour of the ground. (These anti-scalp packages are optional, depending on the contours of your particular turf.)

5 Year-round versatility.

The Cushman Front Line doesn't go out of service when the mowing season is over. It can work for you all year 'round when you add accessories like the ROPS structure and weathertite cab, 60″ rotary broom (gas unit only) and the 48″ snow thrower.

6 Service when you need it.

Your Cushman Front Line dealer stocks parts for the engines, tractors and decks, and services the entire unit. He's an experienced, thoroughly trained professional, dedicated to keeping your Front Line mower in service.

For a free on-site demonstration of the Front Line quality, contact a Cushman Front Line dealer today. Or call us at 402-435-7208 for the location of your nearest dealer.

CUSHMAN® FRONT LINE.™

It stands to reason.

3110 Cushman, P.O. Box 82409
Lincoln, NE 68501

Circle No. 111 on Reader Inquiry Card

© Outboard Marine Corporation, 1981
All rights reserved.

CUT2-5780

WT&T

EVENTS

The current issue of WEEDS TREES & TURF carries meeting dates beginning with the following month. To insure that your event is included, please forward it, 90 days in advance, to: WEEDS TREES & TURF Events, 757 Third Ave., New York, NY 10017.

Kentucky Cemetery Association Annual Convention, Executive Inn, Louisville KY. June **June 10-12.** Contact Lewis Tingley, Resthaven Memorial Park, P.O. Box 18068, Louisville, KY 40218, 502/491-5950.

Florida Nurserymen and Growers Association Annual Convention, Doral Country Club, Miami, FL, **June 10-13.** Contact Barbie Derby, FNGA, P.O. Box 16796, Temple Terrace, FL 33687, 813/985-8511.

7th Nebraska Turfgrass Field Day & Equipment Show, Mead Field Lab, Lincoln, NE, **June 15.** Contact Robert Shearman, University of Nebraska, 377 Plant Science Bldg., Lincoln, NE 68583-0724, 402/472-2854.

Virginia Nurserymen's Association/ Virginia Society of Landscape Designers Joint Summer Meeting, Holiday Inn, Richmond, VA, **June 20-22.** Contact Katherine Martin, PO 427, Richmond, VA 23204, 804/644-0912.

Outdoor Power Equipment Institute Annual Meeting, La Costa Hotel and Spa, Carlsbad, CA, **June 20-23.** Contact Dennis Dix, OPEI, 1901 L Street, NW, Suite 700, Washington, DC 20036, 202/296-3484.

American Bonsai Society Symposium 82, University of Maryland/ College Park, **June 24-26.** Contact Tim Sobol, 1226 Woodrow Avenue, Norfolk, VA.

American Society of Landscape Architects Southeast Regional Conference, Knoxville Hilton, Knoxville, TN, **July 15-17.** Contact Thomas Main, 3708 Kingston Pike, Knoxville, TN 37919, 615/632-4924.

Western Canada Horticultural Trade Show, Pacific National Exhibition Grounds, Vancouver, BC, Canada, **July 12-13.**

American Association of Nurserymen Annual Convention, Sheraton Waikiki Hotel, Honolulu, HI, **July 17-21.** Contact Bob Lederer, 202/ 737-4060.

Society of American Florists Annual Convention. Fontainebleu Hotel, Miami, FL, **July 21-25.** Contact Darryl McEwen, 800/336-4743.

University of Georgia CES Turf Field Day, Athens, GA, **July 21.** Contact Dr. Gilbert Landry Jr., University of Georgia CES, Department of Agronomy, Athens, GA 30602, 404/542-2692.

American Sod Producers Association 16th Annual Convention and Field Days, Stouffer's Inn, Denver, CO, **July 21-23.** Contact ASPA, 9th and Minnesota, Hastings, NB 68901, 402/463-4683.

EMBARK® Plant Growth Regulator (PGR)

WHAT

A solution to suppress turf growth for up to 8 weeks.

EMBARK PGR can significantly reduce or even eliminate mowing requirements for 5 weeks on bermudagrass, and up to 8 weeks on grasses such as Kentucky and annual bluegrass, fescues, perennial ryegrass, quackgrass and many others.

Unsightly seedheads will also be suppressed or eliminated.

WHERE

A work-saver on low-maintenance grasses, hard-to-mow and trim areas.

Put EMBARK PGR to work along highways, around industrial parks, at cemeteries and wherever else you want a uniform appearance of grass with less mowing.

Also reduce mowing hazard and time on slopes, around headstones and other hard-to-mow areas. Grass remains viable and green.

Residential Design Short Courses, Scottsdale Country Club, Scottsdale, AZ, **Basic Landscape Design, July 22-24; Landscape Construction Details, July 26-28, Advanced Landscape Drawing, July 30-31.** Contact ALCA, P. O. Box 27312, Tempe, AZ 85282.

Planting Designs Short Course, Ohio Agriculture Research and Development Center, Wooster, OH, **August 2-4.** Contact Fred Buscher, Wooster Area Extension Center, Ohio State University CES, 216/262-8176.

International Society of Arboriculture 58th Annual Conference, Galt House, Louisville, KY, **August 8-11.** Contact E.C. Bundy, ISA, PO 71, Urbana, IL 61801, 217/328-2032.

California Associaton of Nurserymen Convention, El Rancho Hotel, Sacremento, CA, **Sept. 21-23.** Contact Elaine Thompson, CAN, 1419-21 Street, Sacremento, CA 95814, 916/448-2881.

Florida Nursery and Allied Trades Show, Curtis Hixon Convention Center, Tampa, FL, **Sept. 24-26.** Contact Barbie Derby, FNGA, P.O. Box 16796, Temple Terrace, FL 33687, 813/985-8511.

Scientific Guide To Pest Control Operations

by Dr. L.C. Truman
Dr. G.W. Bennett and
Dr. W.L. Butts

Domestic: $29.50* (hardcover)
Foreign: $34.50* (hardcover)

The SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS is designed to provide a sound basis for studying the scientific aspects of pest control and promote technical competence. It places emphasis on urban and industrial pest problems. This volume also covers the laws and regulations concerning the pest control industry.

The SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS is written for owners, supervisors, servicemen, salesmen, students, persons preparing for state certification under the EPA/state programs for commercial pesticide applicators, and people interested in structural pest control.
The SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS - a *must* for anyone involved in the field of pest control!

Return this coupon to: Book Sales
Harcourt Brace Jovanovich Publications
One East First Street, Duluth, MN 55802

Domestic: $29.50* (hardcover)
Foreign: $34.50* (hardcover)

YES! Please send me_____copy(ies) of the SCIENTIFIC GUIDE TO PEST CONTROL OPERATIONS.
A check or money order for_____is enclosed.
Please charge to my Visa, Master Card, or American Express (circle one)
Account Number_____Expiration Date_____
*Please add $3.00 per order plus $1.00 per additional copy for postage and handling.
Name_____
Address_____
City_____State_____Zip_____
Signature_____Date_____
Phone_____

Quantity rates available upon request.

Please allow 6-8 weeks for delivery

Keeps turf as trim as the budget... easily.

WHY

One mowing instead of eight saves time, labor and budget

With EMBARK PGR, mow once instead of 8 times. You could start saving after you eliminate the second mowing. Also frees up the crew to get more jobs done with the same people in the same time.

If you'd like to calculate your specific mowing costs and potential savings...

Ask for your free guide

HOW

Applies easily with standard spray equipment

Apply anytime turf is actively growing. Use a range of spray equipment from truck mounted booms to a backpack unit.

Product Application Handbook is available from your distributor. Anyone on the job can also call toll-free for answers on equipment calibration.

For your free Mowing Costs Guide and toll-free call card contact your dealer or Agricultural Products/3M, 223-6SE, St. Paul, MN 55144.

EMBARK is a reg. TM of 3M.

3M Hears You.

3M

Circle No. 135 on Reader Inquiry Card

WT&T CLASSIFIEDS

RATES: 75 cents per word (minimum charge, $20). Bold face words or words in all capital letters charged at $1.00 per word. Boxed or display ads charged at $70 per column inch (one inch minimum). Agency commissions will be given only when camera-ready art is provided by agency. For ads using blind box number, add $5 to total cost of ad. Send ad copy with payment to Dawn Anderson, WEEDS, TREES & TURF, 1 East First Street, Duluth, MN 55802.

BOX NUMBER REPLIES: Mail Box number replies to: WEEDS, TREES & TURF, Classified Ad Department, 120 W. 2nd St., Duluth, MN 55802. Please include box number in address.

BUSINESS OPPORTUNITIES

WANT TO BUY OR SELL a golf course? Exclusively golf course transactions and appraisals. Ask for our catalog. McKay Golf and Country Club Properties, 15553 N. East Street, Lansing, Michigan 48906. Phone (517) 484-7726. TF

HELP WANTED

LANDSCAPE ARCHITECTURE/SALES: Houston design build firm seeking people experienced in both design & sales. Excellent salary opportunities & benefits. Send resume & salary history to Paul Holsinger, L.D.C. Houston, Inc., Rt. 2, Box 160-E, Richmond, Texas 77469. 7/82

LANDSCAPE DESIGNER-SALESMAN. Established, growing firm in southern New York engaged in residential and commercial design and installation, seeking aggressive, proven salesman. Experience necessary. Send resume, salary history to: Shade & Sun Nursery, Inc., Route 52, Stormville, NY 12582. 6/82

Nursery Manager wanted—Well established, successful nursery located in Vail, Colorado is seeking a manager or management team (husband/wife) to run year round operation. Present owner is interested in eventually selling a portion of his equity to new manager. Only those qualified in the nursery industry need call. (303) 476-3047. 7/82

TREE SPECIALIST—Individual with detailed tree/shrub background and some lawn experience needed for growing company in Mid-Atlantic states. You will perform sales duties and help refine our tree care program. Good pay/benefits; year 'round employment. Come grow with us. Send resume in confidence to WTT Box 295. 7/82

SALESMAN: To sell complete line of lawn and turf equipment to Golf Courses and Commercial Accounts for South Florida's most aggressive dealer. Salary plus commission, truck. Experience required. Send resume and references to Degen's Turf & Garden, Inc., 3912 S. State Road 7, Miramar, FL 33023. 6/82

GENERAL MANAGER—For rapidly expanding Eastern United States lawn and tree care company. We are a long established, well financed, multi-office organization with plenty of opportunity and rewards commensurate with experience and performance. You must have it all: managerial/people skills, sales ability, in-depth technical expertise. Horticulture or related degree preferred, but not required. This is the opportunity you have been looking for. Send resume to WTT Box 298. 7/82

GOLF COURSE MANAGER—Lake Texoma State Golf Course, Kingston, OK seeks individual in all phases of golf course operation. Responsibilities include all building and grounds maintenance on a new 18 hole course with automatic underground irrigation and new maintenance equipment. Salary, living quarters, utilities and other benefits. Send resume to Lake Texoma State Park, Box 279, Kingston, OK 73439. 6/82

FOR SALE

SKYWORKER AERIAL BUCKETS: Sales, Parts and Service. New and used units available to 65 feet. New and Used brush chippers, Hydro Ax's, used stumpers, sprayers and digger derricks also available. Call or write P.C. GOULD SALES COMPANY, Plains Road, Essex, Conn. 06426. (203) 767-1636. 6/82

SPRAYERS—FACTORY DIRECT. Professional gardeners, turf applicators, proven dependability, unconditionally guaranteed. Black River Sprayers, Dept. 1-A, P.O. Box 11, Long Beach, NC 28461. 6/82

Northern grown pure Meyer Zoysia (Z-52) your future great water and $ saving turf—Guaranteed Bermuda & bug free—"Beauty Lawn Sod" (Cincinnati) (513) 424-5722. 8/82

FOR SALE—9-Hole, Par 3 golf course in Eastern Mass. (Southboro) 1300 yards, well landscaped, excellent greens, 12 yrs. old, mowed tee to green, flat, 1300 rounds 1981. Must retire. Heavily populated area. E.L. Kallander, 18 Meadow Lane, Southboro, MA 01772. (617) 485-3834. 6/82

SOD-GRASS-SPRIGS Hy Bermuda 419 & 328 —$1.10/sq. yd., Meyer Z-52 Zoysia—$2.25/sq. yd., Centipede—$1.50/sq. yd., Sprig prices quoted—ship anywhere Bayou Pierre Turf Farms, Carpenter, MS 39050. (601) 885-8281 or 956-5034. TF

LAWN SEED. Wholesale. Full line of top quality grasses. Improved bluegrass varieties, fine fescues and fine bladed ryegrasses. We specialize in custom mixing. Oliger Seed Company, 2705 Wingate Avenue, Akron, Ohio 44314. Call collect (216) 753-2259. 4/83

RAILROAD TIES & bridge timbers direct from railroad contractor now taking up track in South Fla. New or Used shipped anywhere. (305) 453-1598. 6/82

USED EQUIPMENT

FOR SALE: "Sod Master" sod cutter. Like new—$425.00. Phone: (414) 336-1737. 6/82

SPYDER Forklift/trailer, 200 hours, exc. cond., Zionsville, IN $12,400. George (317) 873-5231 or (317) 873-5937. TF

FOR SALE: Ryan Sod cutter w/roll ryder, $1,350. 5 gang Roseman mower, sharpened, $1,350. 5" Irrigation pipe, $1 per foot. 40 acre Sod wholesale. (414) 326-5267. 6/82

2—Seven Gang, Six bladed Jacobsen Fairway Mowers with frames. Reconditioned and Sharpened. Semi-pneumatic tires. $1200 and $1500. Green Valley Turf, Avon, Ohio, (216) 934-4661. 7/82

4 cylinder, 12 inch Asplundh chipper. Excellent condition. $4,200. 80 inch Lely TS-200 turf shaper with seed box. Used 20 hours. $2,995. 1974 50 foot skyworker on a 1974 Chevy, dumping chip box. Excellent condition. $24,995. Edwards Tree Service, (216) 988-4477. 7/82

Completely overhauled and dielectrically insulated 45' Sky-Workers, One alpine Sky-Worker, 57'—For Sale or Rent. 90 day guarantee on sales. Call Aerial Lift, Inc., Milford, Conn. (203) 878-0694. TF

USED GOLF CARS FOR SALE—All makes and models, 3 & 4 wheel, electric or gas. If we don't have your choice in stock we can get it. Transportation available. Mid-Atlantic Equipment Corp., Collegeville, PA. Call Now! (215) 489-1400. TF

HI-RANGER BUCKET TRUCKS, 54' and 51', Flatbed and chip box mitts—Merrill brush chipper. Allied Enterprises, Inc., W. 204 N. 11509 Goldendale Rd., Germantown, WI 53022, (414) 255-6161 anytime. TF

Used Spray Units For Sale

1,250-gallon stainless steel tanks. Mechanical agitation. FMC 20 gallon/minute pump. Hanney electric reel. Ford F600 and Chevy C60's—'76's, '77's, '78's and '79's.

Call (502) 241-7341. TF

FOR SALE: Stump Cutter, Vermeer Model 10, in excellent condition. Price: $5,000.00. 1977 GMC Trimming Truck, 350 with 5 ton Omaha Hoist, chip bin & built-in tool compartments. Good condition. Price: $7,000.00. 1971 12" Asplundh Brush Chipper, 1 72 Ford Engine, good condition. Price: $4,500.00. FUNK BROS. TREE SERVICE, INC.—ASHLAND, OHIO—PHONE: (419) 325-2113. 6/82

Princeton Model 4020 Self Propelled Sod Harvester new J.D. engine, excellent condition. Piggy-Back Fork Lift Demonstrator. Call (614) 837-9096. 6/82

Bean Rotomist Sprayer Model 100G, used twice, $10,000 or best offer. (804) 973-4577. TF

Finn Bantam 8 Hydroseeder mounted on tandem trailer. Trailer never used. Very good condition. Will deliver. (219) 291-1413. 6/82

REPOSSESSED

1980 Princeton Self-Propelled Model 4020 Sod Harvester, John Deere Engine, 850 hours. Loaded with extras. Excellent condition. Two Princeton Diesel-Powered Piggy-Back Fork Lifts. Excellent condition. Call Carl Carnesecca, Wasatch Bank. Phone (801) 785-5001. 7/82

For sale—used equipment: 1974 Ford F 600 with Asplundh bucket L42, 1973 Ford F 500 with Macabe power bucket ABS 1-32, 1974 Ford F 700 with Pitman Hydra-Lift M-50 N.T.B. with dump body, 1972 Ford F 700 with Garwood 20 ton winch and large steel dump body, Winch for 518 Cat Skidder M-119, Grapple for 518 Cat Skidder, Rome Feller Buncher 20", 15 12' Truck rack bodies, excellent condition. **CALL:** Monroe Tree & Landscape, Inc. (716) 436-2900. Ask for Tommy. 7/82

HI-RANGERS AERIAL BASKETS 65', 57', and 53'. Skyworkers aerial baskets 65', 50', 40'. Vermeer stump cutter 1560,6. Vermeer tree spade 66, TS 44. Asplundh bucket and brush chippers, Bean sprayer, 9 ton trailer. Parkway Tree Service, 12026 W. Cherry, Wauwatosa, Wisc. 53226. (414) 257-1555. TF

MISCELLANEOUS

LANDSCAPE AND TURFGRASS MANAGEMENT: Obtain the expertise to start and/or manage a landscaping or lawn care business. For information on our two year program contact the Institute of Applied Agriculture, University of Maryland, College Park, Maryland 20742 (301) 454-3938. 4/83

DIESEL HI-RANGER TOWERS—48-100 Feet working heights. Daily, weekly, monthly rentals with or without operator. MATLOCK LEASING, Pottstown, PA (215) 326-7711. 12/82

START YOUR LANDSCAPING CAREER NOW! Write: School of Landscape Design and Sales, Lake City Community College, Rt. 7, Box 42, Lake City, Florida 32055. Fully accredited and V.A. approved. 3/83

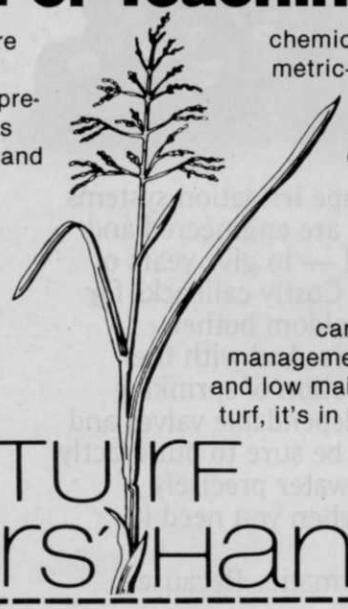
KELWAY® SOIL ACIDITY TESTER, used by PROFESSIONALS nationwide. Direct reading, lightweight, portable, fully serviceable, no power source. Model HB-2 reads moisture too. Available through distributors. For brochure contact Kel Instruments Co., Inc., Dept. T, P.O. Box 1869. Clifton, N.J. 07015 (201) 471-3954.

Use Our Classified Blind Box Service For Confidential Results!

Finally, An Aid For Teaching Turfgrass

Superintendents, Contractors, Lawn Care Managers, New, On-the-Job Reference. The Turf Managers' Handbook is a comprehensive, organized approach to turfgrass science and care. It has been designed and written by leading turf specialists from Purdue, Dr. William Daniel and Dr. Ray Freeborg, for on-the-job reference and as a text for students.

The book contains 150 illustrations and 96 color photographs. Data includes 240 tables and forms. Included are specifications for rootzones, employment, calculations for chemical applications, and extensive metric-imperial conversion. Business and technical aspects of turfgrass management are covered in this 424-page book. Planning, purchasing, hiring, construction, and plant selection are put together for easy on-the-job reference. Markets covered include lawn care, sod production, golf course management, cemeteries, athletic fields, and low maintenance areas. If it concerns turf, it's in the Turf Managers' Handbook.



TURF managers' HANDBOOK

Ordering Information

Please send _____copies of the hardback ($23.95 ea.)
_____copies of the paperback ($18.95 ea.)

*Please add $3.00 per order plus $1.00 per additional copy for postage and handling.

Please charge to my Visa, Master Card or American Express (circle one)
Account Number_____Expiration Date _____

A check or money order for _____ is enclosed.

I understand that delivery may take six to eight weeks.
Quantity and bookstore rates available upon request.

Signature_____

Name (Print) _____

Address _____

City _____State_____Zip_____

Send to:
Book Sales
Harcourt Brace Jovanovich Publications
One East First Street
Duluth, MN 55802

HBJ

WTT 62

Weather-matic Works

and works and works works and works day after day week after week month after month year after year

Automatic landscape irrigation systems from Weather-matic are engineered and tested — and proved — to give years of trouble-free service. Costly callbacks for repairs and service seldom bother Weather-matic owners. And with the industry's finest selection of sprinkler heads and its most dependable valves and controllers, you can be sure to put exactly the right volume of water precisely where you want it, when you need it, without waste.

Insist on Weather-matic. Because it works.

You can't beat the system

Weather matic.
LAWN AND TURF IRRIGATION

Box 18205/Dallas, Texas 75218 214-278-6131

Circle No. 140 on Reader Inquiry Card

ADVERTISERS

Reader Inquiry No.		Page No.
135	Agricultural Products/3M	64, 65
101	American Enka	55
102	Asplundh Mfg. Div.	58
103	Barebo, Inc.	56
104	BFC Chemicals, Inc.	3
105	BFC Chemicals, Inc.	51
106	Brouwer Turf Equipment Ltd.	47
107	Bunton Company	Cover 3
108	Ciba-Geigy Corp.	4, 5
109	Ciba-Geigy Corp.	27
110	Cushman Turf	13
111	Cushman Turf	62, 63
112	Degesch America	15
113	Diamond Shamrock/Ag. Chem Div.	32, 33
114	Ditch Witch Equipment	45
115	Dow Chemical Co. U.S.A.	Cover 2, 1
116	Excel Industries	61
117	Hannay Reels, Clifford B.	16
118	Heckendorn Mfg.	52
120	Jacobsen	37
121	Lofts Seed, Inc.	Cover 4
122	Lofts Seed, Inc.	21
123	Micron Corporation	57
124	Mobay Chemical Corp.	40, 41
125	Monsanto Company	31
126	National Car Rental	54
127	Northrup King Co.	17
128	Olin Corporation	53
129	Oregon Fine Fescue	42
130	P.B.I. Gordon Corporation	48, 49
132	Ransomes, Inc.	19
133	Rhone Poulenc, Inc.	22, 23
134	Safe-T-Lawn	39
136	Spraying Systems Co.	54
137	Toro Company	7
138	Toro Irrigation Division	43
139	Velsicol Chemical Corp.	35
140	Weather-matic, Inc.	68
141	Woods, Div. of Hesston	29

NEW PRODUCTS

Reader Inquiry No.		Page No.
145	Jacobsen	54
146	Clearman	54
147	Deer-Away	54
148	Geerpres	54
149	BASF	56
150	Kubota	57
151	Vandermolen	57
152	Flora and Fauna	57
153	Ryerson	57
154	Conwed	58
155	Framar Industrial	58
156	Southern Hydro Mulch	58
157	Allis-Chalmers	58
158	Bouldin and Lawson	61
159	Rain Bird	61
160	Weather-Matic	61

This Index is furnished for the readers' convenience. However, the publisher can not guarantee its accuracy due to circumstances beyond our control.

BUNTON CUTS THE COST OF CUTTING*

BUNTON®
COMMERCIAL MOWERS

* The new Bunton 61-inch self-propelled mower cuts the same width as a comparable riding mower, but costs about half as much.

61 in.

Or ... Buy two Buntons and cut twice as much grass for about the cost of one comparable riding mower.

122 in.

This new Bunton self-propelled mower is the latest step forward in our constant advance in the design and building of more productive, cost efficient equipment. It is a 16 horsepower, gasoline powered turf mower with excellent maneuverability, fingertip steering and controls, six forward ground speeds and independent blade speed.

Please write or call for additional information.

Bunton builds 'em better.

BUNTON CO.

P.O. Box 33247
Louisville, KY 40232 U.S.A.
Phone 502/966-0550 • Telex 204-340

Contract numbers:
G.S.A.: GS-07S-07659
H.U.D.: OPH (CO)m-3650

Circle No. 107 on Reader Inquiry Card

Prelude

turf-type perennial ryegrass

"Every 'new generation' brings with it something special. So it is with this new ryegrass . . ."

Rich Hurley

It's here. PRELUDE, a "new generation" ryegrass that sets new standards in all 'round performance. The ryegrass that far surpasses those most popular varieties of just a few years ago.

Through Lofts research program, breeding material was obtained from the New Jersey Agricultural Experiment Station, under the direction of Dr. C.R. Funk of Rutgers University. The results? Prelude, the turf-type perennial ryegrass that answers the professional's needs.

- Improved mowability
- Excellent heat and drought tolerance
- Good winter hardiness
- Good resistance to crown rust and brown patch
- Attractive dark green color
- Quick germination
- Fine-leafed, dense growth

This is the ryegrass the golf course superintendents and grounds care people have been waiting for. And it shows exceptional performance in Southern overseeding programs.

Try the "new generation" ryegrass . . . PRELUDE.

LOFTS

Lofts Seed Inc.

Bound Brook, NJ 08805
(201) 356-8700 • (800) 526-3890

Circle No. 121 on Reader Inquiry Card

Rich Hurley, Director of Research at Lofts Seed Inc., heads the company's continuous research programs which enable Lofts to maintain the enviable reputation of being a leader in the turf field with the introduction of superior, proprietary varieties.

Prelude is a product of Lofts Seed Inc. and Great Western Seed Co., Inc.

Great Western Seed Co., Inc.	Lofts/New England	Sunbelt Seeds, Inc.	Lofts/Maryland	Lofts/New York
Albany, OR 97321	Arlington, MA 02174	Tucker, GA 30084	Beltsville, MD 20705	Cambridge, NY 12816
(503) 926-5892	(617) 648-7550	(404) 491-1311	(301) 937-9292	(518) 677-8808

Available Fall 1982